

Bike Path Study



High Desert Corridor Palmdale to Apple Valley (State Route 14 to State Route 18)

June 2014

PARSONS

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STATE OF CALIFORNIA

Department of Transportation

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1 INTRODUCTION

1.1 Project Description

The California Department of Transportation (Caltrans), in cooperation with the Los Angeles County Metropolitan Transportation Authority (Metro), proposes construction of the High Desert Corridor (HDC) as a new transportation facility in the High Desert region of Los Angeles and San Bernardino counties. The proposed 63-mile-long west-east facility would provide route continuity and relieve traffic congestion between State Route (SR) 18 and United States Highway 395 (US 395) in San Bernardino County with SR-14 in Los Angeles County. The project would comprise of one or more of the following major components, including highway, tollway, rail transit, bikeway, and recommendation for green energy facilities. Figures 1-1 and 1-2 are project vicinity and location maps, respectively.

As currently planned, the HDC project would include a bicycle facility, extending along the corridor between major urban centers, from US 395 in Adelanto on the east to 20th Street East in Palmdale on the west. Cyclists traveling from Palmdale to Adelanto should be able to access a planned future bicycle network in the Victor and Apple valleys; hence, the reason for terminating the proposed HDC Bike Path at US 395.

Consideration for such a facility between Adelanto and Palmdale is consistent with Caltrans policy for accommodating non-motorized travel. Deputy Directive 64 (DD-64) requires that Caltrans “fully consider the needs of non-motorized travelers (including pedestrians, bicyclists, and persons with disabilities) in all programming, planning, maintenance, construction, operations, and project development activities and products.” In this regard, Caltrans’ policy is to ensure that all projects consider best management practices (BMPs) for non-motorized travel in all project planning activities.

1.2 Purpose and Need

The purpose of the proposed action is to improve west-east mobility through the High Desert region of southern California by addressing present and future travel demand and mobility needs within the Antelope and Victor valleys. The proposed action is intended to achieve the following objectives:

- Increase capacity of west-east transportation facilities to accommodate existing and future transportation demand
- Improve travel safety and reliability within the High Desert region
- Improve the regional goods movement network
- Provide improved access and connectivity to regional transportation facilities, including airports and existing and future passenger rail systems, which include the proposed California HSR system and the proposed XpressWest HSR system
- Contribute to state greenhouse gas (GHG) reduction goals through the use of green energy features

The specific needs to be addressed by the proposed action include:

- Recent and future planned population growth within the High Desert region
- Limited and unreliable west-east connectivity within the High Desert region
- Regional demands for goods movement to support the growth of the regional economy
- Future demands for the use of green energy, including sustainability and green energy provisions in state law and policy

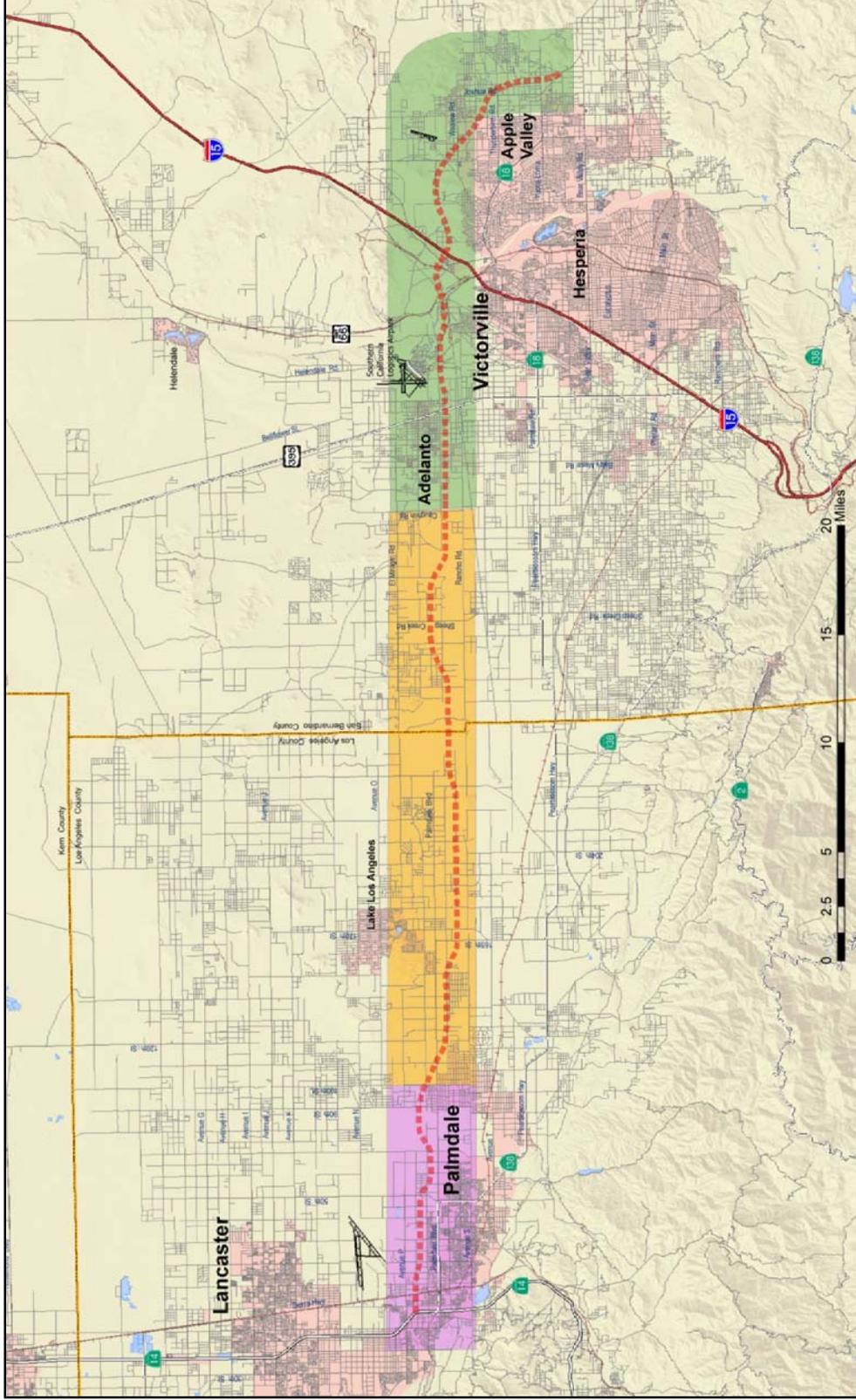
1.3 Setting

The High Desert is typically defined as the arid region north of the San Gabriel and San Bernardino mountain ranges. Starting in the northwestern corner of Los Angeles County near SR-138 and Interstate 5 (I-5), the High Desert extends northeast into Kern County and east into San Bernardino County. This expansive region is home to the Mojave Desert, Antelope and Victor valleys, and a number of small and large communities. The communities through which the proposed HDC would traverse are shown in Figure 1-2 and include Palmdale, Victorville, Adelanto, and Apple Valley.

The project area terrain is relatively flat, with an elevation rise of approximately 265 feet (ft) over 40-plus miles, or an average slope of 0.12 percent. Locally, slopes are less than 2 percent on average, with the exception of the nearby scattered hill outcrops that the alignment avoids. Offsite runoff generally crosses the corridor in a northerly direction. Summertime temperatures in the High Desert average above 90 degrees Fahrenheit (°F), and frequently exceed 100 °F. Average high temperatures for winter months in Palmdale are pleasant, ranging from the high 50s to low 60s, in °F. Nighttime winter low temperatures average from the mid- to low-30s °F.



Figure 1-1. Project Vicinity Map



ANTELOPE VALLEY Los Angeles County Lancaster, Palmdale	HIGH DESERT Los Angeles County–San Bernardino County Lake Los Angeles, El Mirage	VICTOR VALLEY San Bernardino County Adelanto, Victorville, Apple Valley, Hesperia
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Figure 1-2. Project Location Map

1.3 Planning Background

1.3.1 History

The HDC has a long history and has been the subject of numerous, previous studies. It was originally conceived of in the 1930s/40s as a northeast bypass of Los Angeles to provide an alternate route for vehicles traveling from the San Joaquin Valley to communities to the east such as San Bernardino, Victorville, Barstow, and Las Vegas; however, the concept lay dormant until rapid population growth and urbanization in the last two decades of the 20th century led to renewed interest in the project.

In April 2002, Caltrans Districts 7 and 8, in partnership with the HDC Steering Committee, completed a 10-year effort that culminated in publication of the *Regionally Significant Transportation Investment Study* (RSTIS), which provided documentation supporting the need for improved transportation infrastructure to accommodate the expected continuing growth in the rapidly developing Antelope and Victor valleys of Los Angeles and San Bernardino counties, respectively. The RSTIS Steering Committee adopted a corridor similar to that shown in Figure 1-2.

In June 2004, Metro coordinated with the County of Los Angeles to complete the *North County Combined Highway Corridor Study*, a multi-modal transportation plan for the northern Los Angeles County region, addressing short-term (2010) and long-term (2025) requirements to accommodate a variety of trip purposes. The HDC was one of the preferred strategy improvements identified in that study.

In 2005, the HDC, identified as E-220, was officially recognized in Section 1305 of SAFETEA-LU as a high-priority corridor on the National Highway System between Los Angeles and Las Vegas via Palmdale and Victorville.

In 2006, the HDC Joint Powers Authority (HDCJPA) was formed to oversee the financing and construction of a 63-mile stretch of freeway corridor from SR-14 in the Palmdale/Lancaster area through the high desert cities of Adelanto, Victorville, and into Apple Valley. Its members include the County of San Bernardino, County of Los Angeles, Town of Apple Valley, and the cities of Adelanto, Victorville, Lancaster, and Palmdale.

In 2007 and 2009, environmental studies began on two small components of the HDC. The City of Victorville, with oversight from Caltrans District 8, began work on the HDC—Phase 1 project in 2007. This project extended between US 395 and SR-18 on the eastern end of the corridor. On the western end, Caltrans District 7 began working in 2009 on the new SR-138 project between SR-14 and 100th Street East. During the course of conducting these studies and coordinating with regulatory and resource agencies for the proposed projects, it was determined that they should be combined into one large project—the HDC—which incorporates the two “end pieces” and fills in the gap between them.

In April 2010, the Metro Board of Directors authorized entry into a Memorandum of Understanding (MOU) for implementation of the HDC Project, in cooperation with the following entities: HDCJPA, Southern California Association of Governments (SCAG), San Bernardino Associated Governments (SANBAG), State of California represented by Caltrans Districts 7 and 8, County of Los Angeles, County of San Bernardino, and cities of Lancaster, Palmdale, Victorville, Adelanto, and the Town of Apple Valley. On March 22, 2012, the Metro Board formally recognized the project as a Strategic Multipurpose Corridor, with the intent of providing enhanced mobility, as well as economic and environmental benefits. The Board further identified the corridor as potentially being able to accommodate a green energy

production and/or transmission facility, high-speed rail (HSR) feeder service line from Victorville to Palmdale, and bikeway.

1.3.2 Overview of Other Bicycle Facilities in California

There are numerous multipurpose bike paths and trails in California, ranging from less than 1-mile to more than 80 miles long. In addition to existing bike paths and trails, two planned bike paths, each more than 100 miles long when fully developed, are exemplary because they would extend for miles through multiple jurisdictions across diverse terrain:

- **Tahoe-Pyramid Bikeway** – The Tahoe-Pyramid Bikeway organization is planning a continuous 116-mile-long trail from Lake Tahoe City northeasterly along the Truckee River to its terminus at Pyramid Lake in the desert. The trail would consist of a combination of existing dirt and paved paths, plus some sections of new trail and bridges. Descending more than 2,000 ft, use of the bikeway is expected to range from short family outings and horseback riders to adventure cyclists traveling the entire route.
- **Mokelumne Coast to Crest Trail** – For more than 20 years, the Mokelumne Coast to Crest Trail Council has been planning a 300-mile-long non-motorized, multi-use (i.e., hikers, cyclists, equestrians) trail extending from the ocean near San Francisco Bay to the crest of the Sierra Nevada Mountains. This partially completed route generally follows the Mokelumne Aqueduct and the North Fork of the Mokelumne River. Besides a dramatic range in elevation, the trail features many historic sites and nature viewing (Rails to Trails Conservancy, 2014).

Table 1-1 lists several existing multipurpose paths and trails in California that are more than 10 miles long. Most of these have either been planned along an existing highway, rail corridor, river, or coastline. Several of the paths/trails are used predominantly for recreational purposes. Many of them feature scenic views of nature, including mountains, water courses, or the ocean. Historic resources are also integral to several trails, either in the form of structures (e.g., Tarpey train depot), events (e.g., DeAnza exploration) that occurred, or relationships to a famous individual (e.g., Jack London). The bike paths and trails may also allow connections to other trails, between parks and other destinations, and to transit stops. The American River Trail in the Sacramento metropolitan area, which is comparable in distance to the proposed HDC Bike Path, is a good example of a full-service trail, with trail maps, mile markers, water fountains, restrooms, and telephones.

A paved maintenance access road for the California Aqueduct, which once connected the Victor and Antelope valleys, has been closed to bicycles for more than 10 years for public safety and security purposes. Once the “longest officially designated bike path in southern California,” the 107-mile-long bikeway extended parallel to the California Aqueduct along the south end of the Mojave Desert from Silverwood Lake west-northwest past Pearblossom and Palmdale to Quail Lake near Gorman. The California Department of Water Resources, which manages the aqueduct, has no current plans to reopen the paved service road as a bikeway.

1.3.3 Bike Path Usage (Demand) Expectations

For this study, a qualitative assessment of the potential demand for use of the proposed HDC Bike Path was conducted. In general, it is expected that use of the facility would be higher in areas closer to urbanization, located on both ends of the corridor, where a broad range of potential users (e.g., competitive bicyclists, recreational users, senior citizens, and parents with children) are most likely to venture. Use of the HDC Bike Path would also likely exhibit seasonal variation, with much greater demand during cooler months and the short-duration spring flowering period, for example, compared with

Table 1-1. Long Multipurpose Bike Paths and Trails in California

Path/Trail	Location (County)	Trail Characteristics			Special Characteristics
		Length (miles)	Surface(s)	Category	
American River Bike Trail (Jedediah Smith Memorial)	Sacramento	32	Asphalt	Greenway/Non-Rail Trail (Non-RT)	River views; trailside maps; mile markers; water fountains; restrooms; telephones; 2 miles of trail (Cat. II) on street
Bayshore Bikeway (Silver Strand)	San Diego	12.5	Asphalt	Rail Trail	Scenic coastline; bike rentals; wheelchair accessible; historic site (Hotel del Coronado)
Bizz Johnson National Recreational Trail	Lassen	25.4	Ballast, gravel	Rail Trail	Scenic river trail; historic railroad corridor (Fernley and Lassen RR); Paul Bunyan statue at trailhead; camping
Contra Costa Canal Trail	Contra Costa	13.8	Asphalt	Greenway/Non-RT	Urban landscape; historic canal built by Bureau of Reclamation; horseshoe-shaped route
Coyote Creek Trail (San Jose)	Santa Clara	22.1	Asphalt, crushed stone	Greenway/Non-RT	Scenic creek trail; public art; access to several public parks
De Anza Trail	San Diego	22	Dirt, gravel, sand	Greenway/Non-RT	Historic trail dates to explorer Juan Batista DeAnza
El Dorado Trail	El Dorado	11.3	Asphalt, dirt, gravel	Rail Trail	Scenic foothills area; historic railroad corridor with 100-ft-high trestle crossing of Weber Creek
Folsom South Canal	Sacramento	14	Asphalt	Canal	Trail is a component of the Central Valley Project; lots of sun exposure during summer months
Fresno Sugar Pine Trail/Clovis Old Town Trail	Fresno	13	Asphalt	Rail Trail	Historic railroad corridor & Tarpey train depot; trail connects to San Joaquin River Parkway
Guadalupe River Trail	Santa Clara	11	Asphalt, crushed stone	Greenway/Non-RT	Extends through downtown San Jose to Alviso Bay; passes through Guadalupe River Park & Garden
Lake Tahoe Bike Paths (south shore)	El Dorado, Douglas (NV)	10.9	Asphalt, crushed stone	Greenway/Non-RT	Scenic trail along Lake Tahoe linking residential, commercial, and recreational areas
Lake Tahoe Bike Paths (north shore)	Nevada, Placer, Washoe (NV)	19.9	Asphalt	Greenway/Non-RT	Scenic trail along Lake Tahoe linking residential, commercial, and recreational areas
Metro Orange Line Bike Path	Los Angeles	14	Asphalt	Rail Trail	Runs adjacent to new Bus Rapid Transit line; lock-up bike racks for commuters; 2 miles of trail (Cat. II) on street
Mission Bay Trail	San Diego	17	Asphalt	Greenway/Non-RT	Trail links Mission Beach with Ocean Beach; water fountains; restrooms; telephones; picnic tables
Modoc Line	Lassen, Modoc	86	Ballast, Cinder, Crushed Stone, Gravel	Rail Trail	Scenic trail on federal lands follows route of archaic narrow-gauge railroad; no facilities; motorized vehicles allowed for recreational access purposes
Monterey Bay Coastal Trail	Monterey	18	Asphalt	Rail Trail	Scenic coastline; wheelchair accessible; historic railroad corridor & other sites (e.g., Cannery Row); public art; Monterey Bay Aquarium

Table 1-1. Long Multipurpose Bike Paths and Trails in California

Path/Trail	Location (County)	Trail Characteristics			Special Characteristics
		Length (miles)	Surface(s)	Category	
Pacific Electric Inland Empire Trail	Los Angeles, San Bernardino	18.1	Asphalt, crushed stone, concrete	Rail Trail	Historic railroad corridor and train depot; commuter and recreation trail; community center and park connections
Sacramento River Trail	Sacramento	11.1	Asphalt, gravel	Rail Trail	Scenic river; mountain and nature views; historic sites including Shasta State Historic Park
San Diego Creek Bikeway	Orange	12	Asphalt	Greenway/Non-RT	Scenic creek views; trail connects Irvine Civic Center with university, parks, mall, entertainment, and medical uses
San Francisco Bay Trail (Airport to Hunters Point)	San Francisco, San Mateo	11	Asphalt	Greenway/Non-RT	Scenic coastal and creek views; commuter and recreation trail; interpretive signs, benches; picnic tables; wildlife
San Francisco Bay Trail (Alameda, Oakland, Hayward shoreline)	Alameda	31	Asphalt, dirt, gravel	Greenway/Non-RT	Short segments linked by on-road bike lanes; scenic coastal and marsh views; historic Jack London Square; parks; wildlife
San Francisco Bay Trail (Carquinez Strait, Vallejo, Napa River)	Contra Costa, Napa, Solano	24	Asphalt	Greenway/Non-RT	Two bridge crossing options over Carquinez Strait; parks; historic sites; scenic coastal and river views
San Francisco Bay Trail (Coyote Hills, Alameda Creek, Fremont)	Alameda	25.5	Asphalt, gravel	Greenway/Non-RT	Trail offers both urban and natural environments; trail crosses Don Edwards San Francisco Bay National Wildlife Refuge; bird watching; scenic views; fishing
San Francisco Bay Trail (Emeryville to Richmond)	Alameda, Contra Costa	27	Asphalt	Rail Trail	Trail links parks along the Bay; informative signs explain area's history, including ferries, shipyards, and brick plants
San Gabriel River Trail	Los Angeles, Orange	38	Asphalt, Concrete	Greenway/Non-RT	Trail connects Pacific Ocean to base of mountains; diverse urban landscapes; parks; drinking fountains; restrooms
San Gabriel – Santa Ana River Connector Trail	Orange	12.5	Asphalt, Concrete	Greenway/Non-RT	Scenic trail along coastline; links San Gabriel River Trail with Santa Ana River Trail; 2+ miles of trail on street
Santa Ana River Trail	Orange	30	Asphalt, Concrete	Greenway/Non-RT	Trail connects Pacific Ocean to Prado Reservoir; links diverse urban landscapes, business, and shopping
Santa Ana River Trail	San Bernardino	20	Asphalt, Concrete	Greenway/Non-RT	Trail passes through Santa Ana River Regional Park
Santa Monica Beach and South Bay Bike Path	Los Angeles	21	Asphalt, Concrete	Greenway/Non-RT	Scenic coastal trail broken by three short on-street paths; two state beaches; parks; drinking fountains; restrooms
Shady Canyon Trail Loop	Orange	10	Asphalt, Concrete	Greenway/Non-RT	Trail connects four City of Irvine bikeways in loop ride; city vistas; short segment of on-street riding
West County Trail and Joe Rodota Trail	Sonoma	14	Asphalt	Rail Trail	Trail crosses farmland, along creek and lagoon; long segment of trail crosses through Sebastopol on bike lanes

Source: Rails to Trails Conservancy, 2014. Information accessed on-line at: <http://www.trailink.com/state/ca-trails.aspx>.

during hot summer months. Bike path usage would also depend on factors such as what amenities are offered, how well the path is connected to the existing and planned transit networks, and how well the facility is marketed to the public. These topics are discussed in Sections 2.3.1, 3.1, and 4.3, respectively. Bike path demand is further discussed below by segment.

Victor Valley Segment. The eastern HDC terminus at US 395/Air Expressway is in close proximity to several employment centers and other destination points, including Southern California Logistics Airport and its associated industrial park, Victorville Federal Correctional Complex, Adelanto City Hall, San Bernardino County Sheriff's Station, community parks, and Heritage Field at Stater Bros. Stadium. City planning and zoning documents call for future long-term residential development extending west along Air Expressway. Hence, while the HDC Bike Path would not serve commuters under present conditions, as homes are built to the west of US 395, it is anticipated there would be increased demand for such a facility.

Another consideration with regard to ridership potential within this segment is poor accessibility via non-motorized transportation needs. Currently, there are no bicycle facilities within Adelanto, and the Victor Valley in general is underdeveloped for these purposes. In this regard, establishment of a bikeway(s) from the HDC terminus to downtown Victorville is a key consideration. From downtown, bicyclists can make connections with planned bikeways extending farther east into Apple Valley and south into Hesperia. SANBAG has developed a countywide Non-motorized Transportation Plan (SANBAG, 2013) to address the growing popularity of cycling and to coordinate the individual bike plans of the county's individual cities into a cohesive bikeway system. The plan identifies many proposed routes within and through this segment that are also described in the City of Victorville's Non-motorized Transportation Plan (City of Victorville, 2010). Consistent with the SANBAG study, the Victorville plan would create links to the proposed HDC Bike Path via Air Expressway. From Air Expressway, access into downtown Victorville could be gained via North D Street (Old Route 66) and the partially completed Mojave Riverwalk Trail, or cyclists could connect to Mojave Drive by riding south using a planned Class 2 or 3 bikeway on Village Drive.

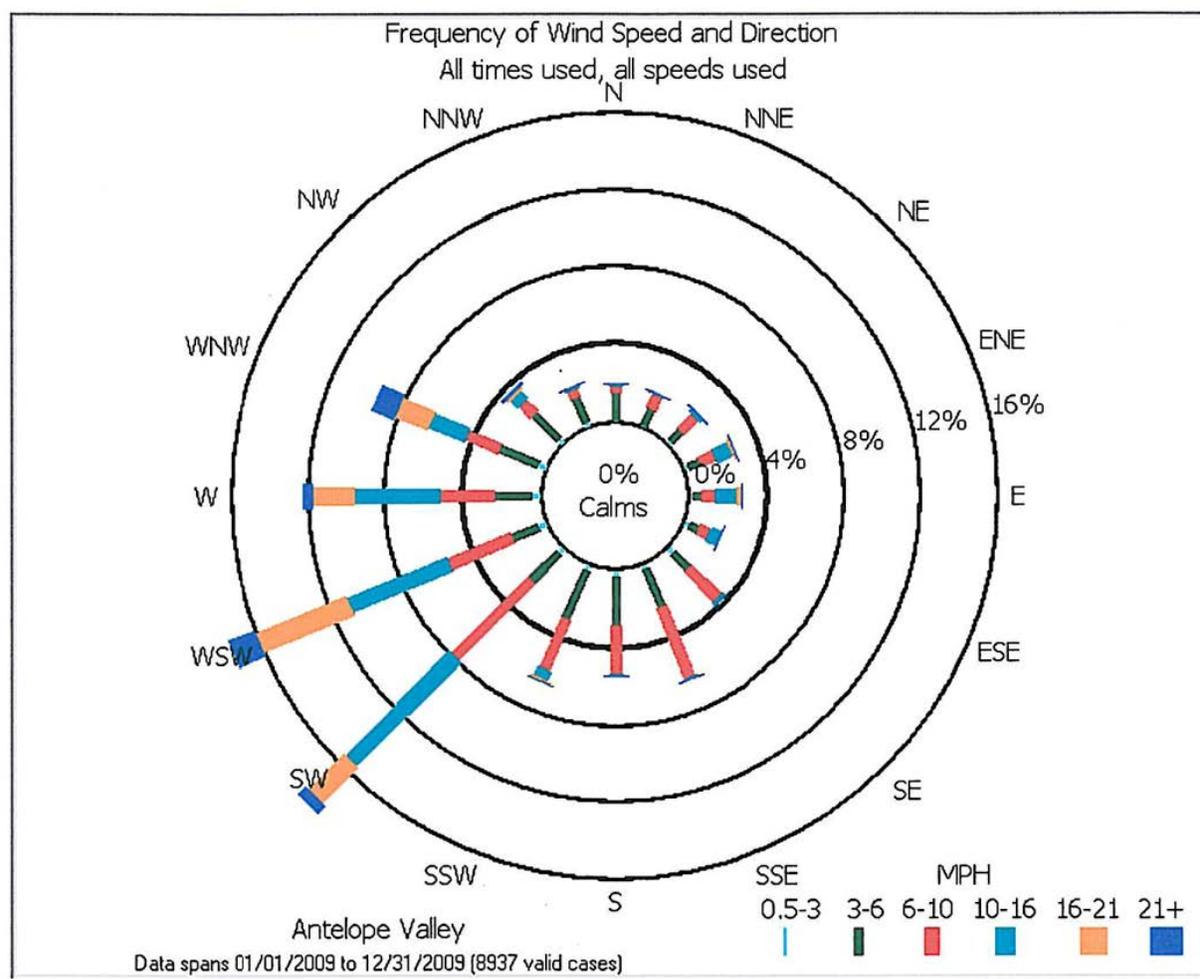
High Desert Segment. The proposed HDC Bike Path would be constructed between two urban areas approximately 50 miles apart (i.e., from Palmdale to Victorville business districts). There is very little business activity between these destinations. Even assuming a fast-paced cycle of 20 miles per hour (mph), it would take a cyclist approximately 2.5 hours each way between home and work. With predominant wind speeds out of the west-southwest, as shown in Figure 1-3, it could take much longer on windy days to ride from east to west. Going from west to east would generally be with the wind during most of the year. For these reasons, it is expected that use of the bike path for daily commuting would be minimal within this segment; therefore, recreational bicyclists would be the primary users.

Despite these limitations, the proposed HDC Bike Path would draw recreational cyclists as the only bike facility extending between the Victor and Antelope valleys. On its own merits, as a direct east-west Class I facility, it is presumed that building the bike path would be an incentive for people to use it. The bike path would be a much more direct and safer option compared with the use of existing narrow roadways not designed for bicycles. Some people would likely be curious to ride the new facility. See Section 2.3.2 below for more discussion about this segment.

Antelope Valley Segment. The west end of the proposed HDC Bike Path corridor, running from 20th Street East to 100th Street East, would likely have the most potential for future use by commuter cyclists. Here, the bike path would provide direct access across flat terrain to employment destinations in downtown Palmdale. Commuter bicyclists could continue on via Metrorail to destinations in Lancaster, San Fernando Valley, or Los Angeles, or continue cycling into Lancaster via the Sierra Highway Bike Trail. Generally speaking, as the east side of Palmdale continues to urbanize, especially to the west of 50th

Street East, it can reasonably be expected that demand for commuter bike path use would concurrently increase.

Figure 1-3. Antelope Valley Wind Rose Data, 2009



Source: Allen, M., Foster, D. and Pawling, S. 2010. "Capping the Dust in the Antelope Valley." Paper 2010-A-612-AWMA, Figure 18.

Commuter and recreational use of the proposed HDC Bike Path in the greater Palmdale area are also expected to increase with time due to incremental expansion of the City’s bikeway and multipurpose trail network. Over the next several years, the Cities of Palmdale and Lancaster are planning to greatly expand their respective bikeway networks, which should provide incentive for people to choose non-motorized transportation. Implementation of the City of Palmdale Bikeway and Multi-Purpose Trail Plan (City of Palmdale, 2011) would provide much improved north-south and east-west accessibility across the east Palmdale region. See Section 2.3.2 below for more discussion about this planning document.

To maximize use of the new bicycle facility within this segment, consideration should be given to connecting the HDC Bike Path with a planned bikeway on Palmdale Boulevard. Making such a connection at 100th Street East would facilitate direct access to downtown through more populated areas of east Palmdale where excellent bus transit service exists. The aforementioned Bikeway and Multi-Purpose Trail Plan shows adopted master plan routes along Palmdale Boulevard east of 47th Street East, along 47th Street East and 50th Street East, and into downtown via either Avenue Q East or Avenue R East.

1.4 Project Alternatives

Several project alternatives and design variations have been considered and evaluated. A No Build Alternative and four build alternatives were selected for detailed evaluation in the Draft Environmental Impact Report/Environmental Impact Statement.

1.4.1 *No Build Alternative*

Under the No Build alternative, no new transportation infrastructure would be built within the project area to connect Los Angeles and San Bernardino Counties aside from existing SR-138 safety corridor improvements in Los Angeles County and SR-18 corridor improvements in San Bernardino County. Traffic circulation and congestion currently experienced on Palmdale Boulevard, Air Expressway, and Happy Trails Highway (existing SR-18) would remain. The no action alternative functions as a baseline to compare against all of the proposed build alternatives.

1.4.2 *Freeway/Expressway Alternative (Avenue P-8, I-15, and SR-18)*

This alternative would consist of a combination of a controlled-access freeway and an expressway. It generally would follow Avenue P-8 in Los Angeles County and just south of El Mirage Road in San Bernardino County. This alternative then extends east to Air Expressway Road near I-15 and curves south, terminating at Bear Valley Road. The incorporation of green energy technologies and a bike path along segments of the alternative would also be considered.

Four physical alignment variations are being considered, including:

- Variation A: Near Palmdale, the freeway/expressway would dip slightly south of the main alignment, approximately between 15th Street East and Little Rock Wash.
- Variation B: East of the county line, the freeway/expressway would flare out slightly south of the main alignment between Oasis Road and Coughlin Road. Variation B1 would be at the same location, but it would flare out a little less and pass through the Krey airfield.
- Variation D: Near the community of Lake Los Angeles, the freeway/expressway would dip slightly south of the main alignment, just south of Avenue R approximately between 180th Street East and 230th Street East.
- Variation E: Near Adelanto and Victorville, the freeway/expressway would dip south of the federal prison.

1.4.3 *Freeway/Expressway Alternative with High-Speed Rail (HSR) Feeder/Connector Service*

This alternative would be the same as the Freeway/Expressway Alternative except that it would also include an HSR Feeder/Connector Service between the cities of Palmdale and Victorville. The HSR Feeder/Connector Service would utilize proven steel wheel-on-steel track technology and have a design speed of 180 miles per hour (mph) with an operating speed of 160 mph. Additional details of this operating feature, including the type of train technology (i.e., electric versus diesel-electric), its location in relation to the HDC (median-running alignment), and its connections to existing and proposed rail stations, are being evaluated as part of an ongoing Rail Alternatives Analysis. The incorporation of green energy technologies and a bike path would also be considered.

1.4.4 Freeway/Tollway Alternative with High-Speed Rail Feeder/Connector Service

This alternative would be the same as the Freeway/Expressway Alternative except that it would also include an HSR Feeder/Connector Service between the cities of Palmdale and Victorville. The incorporation of green energy technologies and a bike path would also be considered.

1.5 Bicycle Facility

1.5.1 Design Concept

Because the project is only in the project approval/environmental document (PA/ED) phase, there is no available design for the proposed HDC Bike Path; however, the following characteristics/features are proposed:

- The facility would be a Class 1 Bikeway (Bike Path), as defined in Caltrans' Highway Design Manual (HDM), Chapter 1000¹ as a "completely separated ROW for the exclusive use of bicycles and pedestrians with cross-flow by motorists minimized."
- The facility would be constructed parallel to and within ROW to be acquired as part of the HDC corridor. The HDC Bike Path would be constructed at an appropriate separation from the motorized transportation uses; no closer than 5 linear ft from the freeway shoulder with an intervening fence/barrier.
- The HDC Bike Path would be designed as a bidirectional, shared-use (i.e., non-motorized uses) facility in accordance with the HDM, Chapter 1000 requirements.
- Clear signage would be provided indicating hours of operation; use restrictions (e.g., motor vehicles prohibited); safety protocol; and emergency contact information.
- The facility would be designed to provide safety and security of all users.
- The facility would provide existing and future connections to the north and south, as well as links to local and regional transit connections.

The HDC Bike Path would be designed as an all-weather, multiuse pathway, capable of accommodating pedestrians, bicycles, and universally accessible modes, as well as providing access for emergency vehicles. Bike path design issues to be considered include, but are not limited to, the following:

- Width and surfacing to accommodate proposed usage
- Facility drainage and surface needs
- Vehicular load rating for emergency access
- Location and type of fencing and screening
- Safety of bike path users next to active highway/railroad ROWs
- Safe crossings at existing and future street intersections
- Liability and operational concerns of the State and any involved private interests
- Management requirements and costs to be incurred by involved parties for long-term management and maintenance of the proposed bike path facility
- Visibility and security concerns of adjacent property owners that abut the alignment (City of Fremont, 2009).

¹ See Appendix B for a complete version of HDM, Chapter 1000.

1.5.2 *Bike Path Safety and Security*

The proposed HDC Bike Path design would be developed with public safety and security clearly in mind. The design would be in accordance with HDM, Chapter 1000, which includes requirements for minimum path dimensions, banked curves (if necessary), appropriate clearances, and other measures intended to maximize public safety.

Site conditions themselves present safety concerns. As discussed in Section 3.2 below, the freeway/bike path corridor crosses open desert with extreme temperature conditions, substantial distance from emergency service providers and other services, and is in an environment where natural hazards such as rattlesnakes and cacti exist. Because of these conditions, it is recommended that shade structures and possibly water fountains be strategically located along the corridor to provide relief for riders and other non-motorized path users.

As discussed below, the spacing, site layout and design of any designated rest stops should be developed with public safety and security as primary considerations. This includes selecting bike racks and other products that do not present hazards, and arranging the restrooms (if provided) and bike parking area so they are in clear view from the path and surrounding areas. Restrooms (if provided) should be of simple design with doors that lock on the inside, and perhaps with a hand washing area on the outside of the structure. Security cameras should also be considered at designated rest stops and other areas where security is determined to be a potential issue.

Signage would be required all along the route, but particularly at path access/egress locations, near designated rest stops, and along at-grade cross streets. A crosswalk and appropriate signage cautioning pedestrians, cyclists, and motorists at each at-grade crossing would be provided. In addition to 'Bike Path' signs, at each path entrance there would be signs outlining bike path rules and signs with emergency contact numbers.

Path maintenance, as described below, is also a public safety measure (e.g., by minimizing sand buildup, bicyclists can maintain better control of their bike as they would be less likely to skid).

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2 CONCEPT-LEVEL IMPROVEMENTS

2.1 Proposed Roadway and Railway

Figure 2-1 shows a typical cross section for a conceptual freeway/high-speed train alternative. This drawing has been developed in support of the environmental analysis being prepared for the proposed project. In general, the proposed project would consist of a controlled-access freeway with the possibility of a future center-median railway within a 500-ft-wide ROW. The roadway would be constructed on fill, and the proposed alignment would be elevated approximately 12 ft above grade. Proposed slopes would generally follow existing grade. Swales and channels would be constructed as flat as possible to minimize erosive flow velocities while maintaining appropriate conveyance capacities. Embankment slopes would not be steeper than 2:1 (horizontal to vertical) and would be constructed at 4:1 or flatter to the maximum extent practicable to minimize erosion.

Like the roadway and bike path, the railway would be constructed entirely within the proposed ROW. While there is currently not a detailed design concept available for the potential future railway, a two-track, grade-separated facility is assumed, with a propulsion and alternating-current overhead catenary system to power electric multiple unit trains. The current preferred option is to align the railway within the freeway median.

Infiltration basins, earthen and concrete channels, cross culverts, storm drain pipelines and inlets, riprap energy dissipation devices, and other forms of erosion protection would be constructed so that runoff would be intercepted and conveyed along and across the roadway alignment without the need for pump stations, while minimizing erosion potential.

2.2 Proposed Drainage System

Facilities would be designed for the 100-year storm event to prevent flooding of the proposed roadway and potential flooding upstream and downstream of the roadway. The project would be designed to allow flood flows to cross the proposed freeway by mimicking existing flow conditions, placing cross culverts at existing flow concentration points along the alignment. Culverts would be sized for the 100-year storm flow and sited along the alignment as dictated by topography at concentrated flow paths. At this preliminary level, culverts are generally assumed to be reinforced concrete box culverts with a minimum height of 4 ft to reduce clogging potential for sediment buildup. Numerous longitudinal channels and ditches would also be placed at the edge of ROW along the alignment to convey offsite flows to the proposed bridge crossings and cross culverts. Infiltration basins would be proposed at most of the interchanges to treat storm water runoff generated from impervious surfaces and for flow control so that flow rates would mimic existing conditions for both high and low flows.

Bridges would be constructed over the deeper streams within the study area. See Appendix A for photographs of Big Rock Wash and Little Rock Wash, the largest watercourses crossing the project corridor. Cross culverts are proposed at the other waterways traversed by the project alignment. The crossings would be designed to minimize impacts to the upstream and downstream water surface elevations, flow velocities, and overall streambed and embankment configurations. Bridge hydraulic analysis has been conducted for the 100-year storm event flow using HEC-RAS computer modeling software provided in the Final Draft Hydrology and Hydraulics Report (Parsons, 2014) prepared for this project.

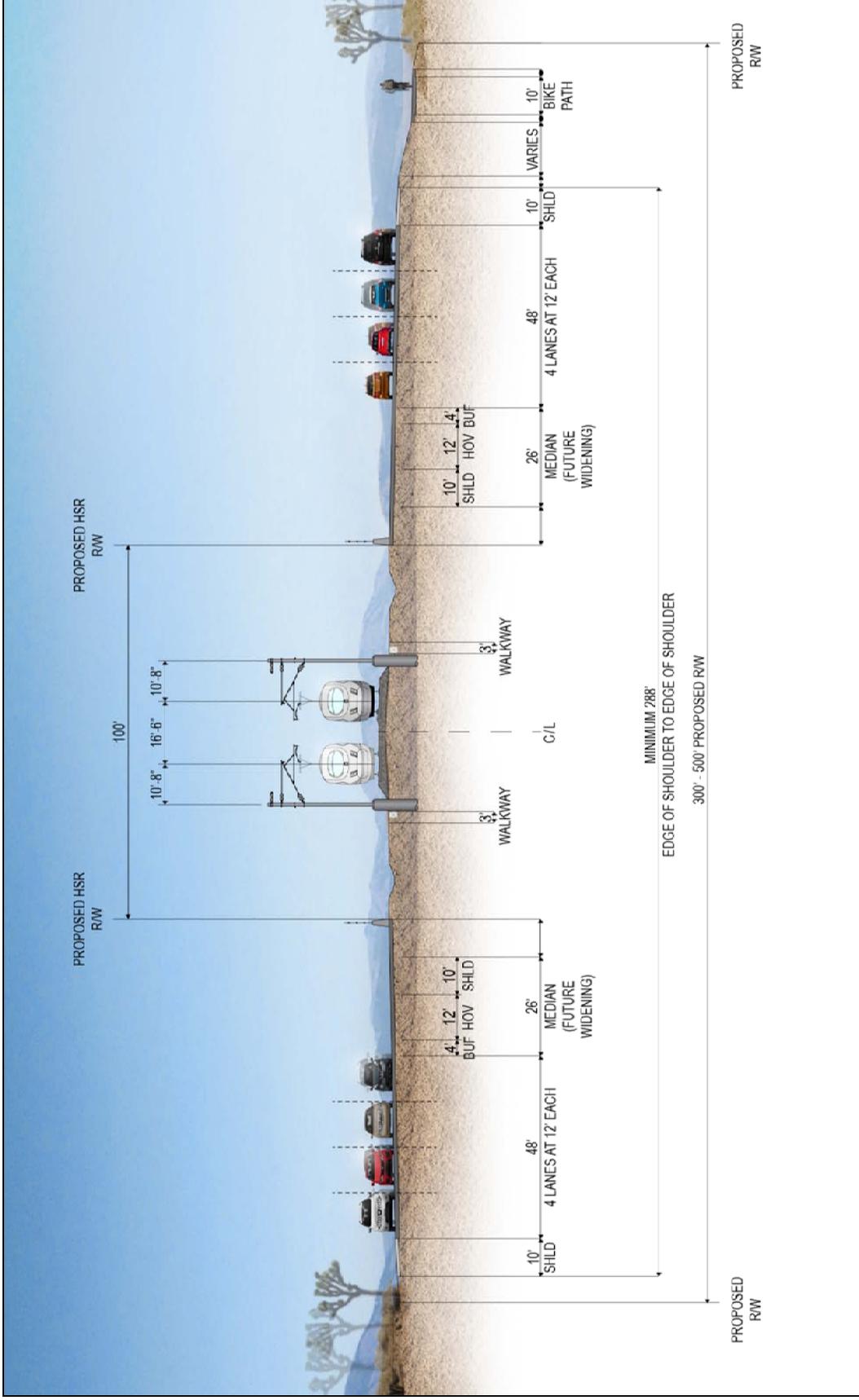


Figure 2-1. Typical Cross Section for Freeway with High-Speed Train Median Alternative

Concept-level bridge details are summarized as follows:

- Little Rock Wash. 15-span, 3,000-ft-long bridge with vertical faced abutments (skewed to follow the alignment of the creek); pier width = 7 ft; Q100 = 22,944 cubic ft per second (cfs); V100 = 2 to 4 ft per second (fps); flow depth = 2 to 4 ft; and maximum rise in water surface elevation = 1.0-ft
- Big Rock Wash. 9-span, 1,800-ft-long bridge with vertical faced abutments (skewed to follow the alignment of the creek); pier width = 7 ft; Q100 = 17,268 cfs; V100 = 4 to 5 fps; flow depth = 2 ft; and maximum rise = 0.2-ft

2.3 Proposed Bike Path

Currently, there are no details about the proposed HDC Bike Path; however, the project would be constructed in accordance with applicable design standards, as described below. In addition, considerations that should be addressed when designing the bike path are described in this section. While not recommended, the option of a one-way bike path on both sides of the new freeway should also be considered. This option is not recommended because it would require more land and cost more than a two-way facility.

2.3.1 Design and Management Considerations

Applicable Standards. Public support and advocacy groups for improved bicycling and walking conditions have advocated for enhanced safety, comfort, and convenience of non-motorized travel. Accordingly, in recent years many laws and regulations now mandate certain planning activities and design standards to guarantee the inclusion of bicyclists and pedestrians. Starting in 1990, the Americans with Disabilities Act (ADA) prohibited governments and most private businesses from discriminating on the basis of disability. This led to design modifications of existing and planned public works facilities for the accommodation of disabled persons. The Transportation Equity Act for the 21st Century (TEA-21) states, “Bicycle transportation facilities and pedestrian walkways shall be considered, where appropriate, in conjunction with all new construction and reconstruction of transportation projects, except where bicycle and pedestrian use are not permitted.” In 2000, the Federal Highway Administration (FHWA) developed a *Policy Statement on Accommodating Bicyclists and Pedestrians in Transportation Projects*. One of the key principles of the Policy Statement is, “bicycling and walking facilities will be incorporated into all transportation projects unless exceptional circumstances exist.” Several other federal statutes were subsequently passed that included requirements for congestion management strategies, consideration and development of intermodal transportation systems, and giving due consideration to the needs of bicyclists and pedestrians when designing projects (Caltrans, 2005).

As stated in Section 1.1, DD-64 establishes policy requiring consideration of non-motorized travelers, including pedestrians, bicyclists, and persons with disabilities, when planning, designing, and operating a new project. DP-22, “Director’s Policy on Context Sensitive Solutions,” supports an approach that involves and integrates community goals in the planning, design, construction, and maintenance processes, including the accommodation of bicyclist and pedestrian needs.

The aforementioned HDM contains a chapter on bikeway planning and design. Chapter 1000 (Caltrans, 2012a) provides design standards and guidelines for on- and off-street bikeways. As a minimum, Caltrans and local agencies must comply with mandatory standards in Chapter 1000 when implementing a new bikeway. This chapter differs from other HDM chapters because it also applies to facilities that are not on the State Highway System.

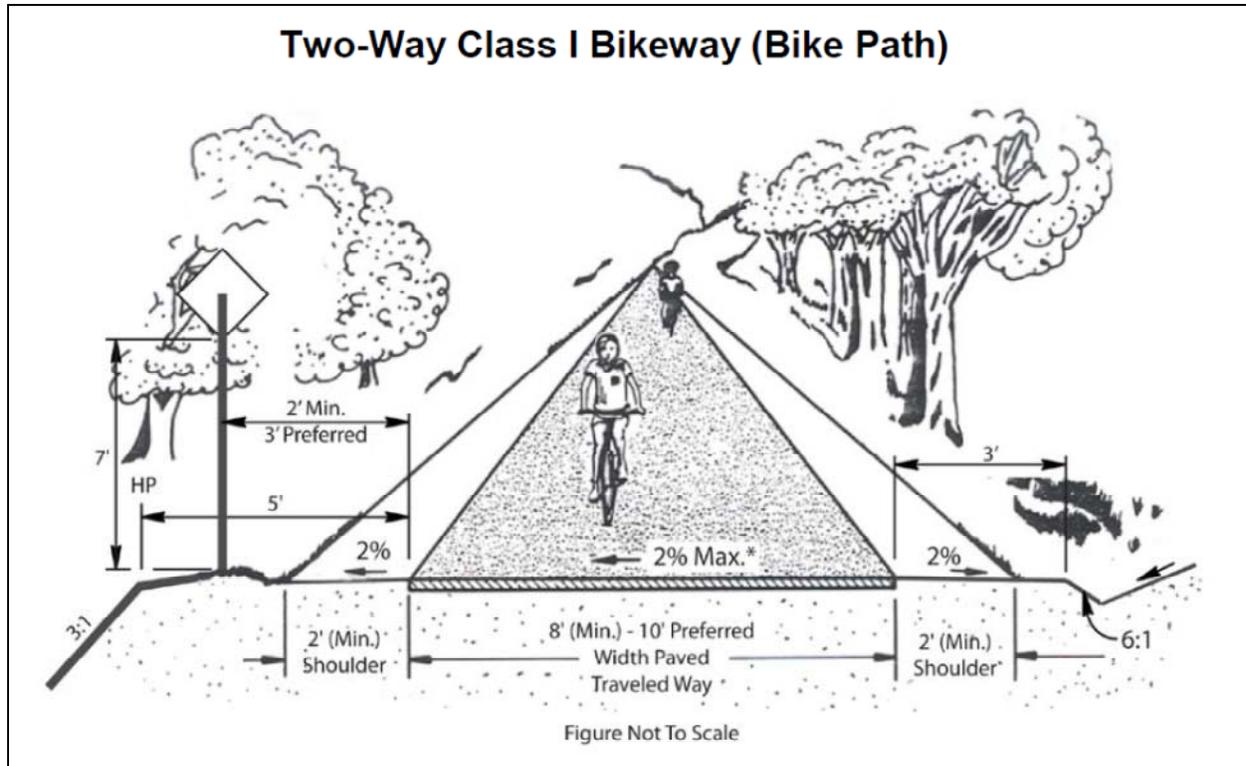
The project would also be designed in compliance with the following design and procedures manuals: Manual on Uniform Traffic Control Devices (MUTCD) (2009), California Supplement; Project Development Procedures Manual, Chapter 31 (Non-motorized Transportation Facilities); HDM, Chapter 100, Basic Design Policies; and Design Information Bulletin 82-01, Pedestrian Accessibility Guidelines for State Highway Projects.

Caltrans Design Requirements. Chapter 1000 design standards require the minimum paved width for a two-way bike path be 8 ft. As shown in Figure 2-2, there is also required a minimum 2-ft-wide sloped shoulder on both sides of the path. In places where heavy bicycle and/or pedestrian traffic are anticipated, a wider path of 10 ft or more is recommended. General requirements defined in Chapter 1000 are provided below:

- Highway Interchanges/Intersections. Bicycle path intersections and approaches should be on relatively flat grades. Where traffic is not heavy, stop or yield signs should suffice; however, adequate warning should be given to permit bicyclists to stop. Where necessary, special purpose ramps or routing may be needed to navigate across an interchange.
- Separation from Highways. Bike paths closer than 5 ft from the edge of shoulder shall include a physical barrier to prevent bicyclists from encroaching onto the highway. Suitable barriers include a chain-link fence or dense shrubs.
- Design Speed. The minimum design speed for bike paths with mopeds prohibited is 20 mph. For bike paths with mopeds allowed, the design speed is 30 mph.
- Superelevation. As shown in Figure 2-2, a maximum superelevation rate of 2 percent is required to allow adequate drainage. A straight 2 percent cross slope is recommended on tangent sections.
- Bridges. Assuming bikeway approaches to the bridge are by way of a separate two-way facility, then a physical separation, such as a chain-link fence or railing, shall be provided to offset the effect of having bicycles traveling against motor vehicle traffic. Bridge railings or fences between traffic lanes and bikeway shall be at least 4.6 ft high. Separate overcrossing structures shall conform to Caltrans' standard pedestrian overcrossing design loading. The minimum clear width shall be the same as the approach, but not less than 8 ft.
- Lighting. "Depending on the location, average horizontal illumination levels of 5 lux to 22 lux should be considered."

Since the proposed HDC Bike Path would be constructed across open desert, minimal Chapter 1000 standards for consideration of sight distances, and design of curves and grades should be easily achieved. For this Bike Path Study, a path width of 10 ft is assumed. It may be necessary to install bollards at entrances to the bike path to prevent unauthorized motor vehicle entry. These and other vertical barriers should be clearly marked to gain the attention of approaching bicyclists, in accordance with MUTCD, Section 9C.101(CA). Bollard spacing should be wide enough to allow a bicycle with side panniers to pass without having to remove the bags.

The bike path should be aligned parallel and to the north or south of a new SR-138 freeway; alignment to the south of the freeway would provide unobstructed mountain views when visibility allows. In addition, consideration should be given to use of an optional path surface because conventional asphalt is impervious and absorbs heat. Subsection 1003.4 of the HDM addresses multipurpose trails, which are not paved but can be developed in accordance with the standards for Class I bikeways.



Source: Highway Design Manual, Chapter 1000 (Caltrans, 2012a).

Figure 2-2. Caltrans Design Requirements for Two-Way Bike Path

Landscaping and Appurtenant Facility Design Options. An attractively landscaped and designed bike path is an important consideration with regard to user demand. These enhancement features should be considered at path entry points and vehicle parking areas, and at (optional) designated rest stops, recommended every 5 to 10 miles. Basic facilities to be considered include plant materials, lighting, signage, fencing and other barriers, and bicycle racks. Beyond these basic requirements, additional considerations in line with the sustainability and community development goals for the overall project (i.e., bike path plus the freeway, green energy, and potentially high-speed train) include, but are not limited to, bicycle lockers, solar energy, shade trees, and educational displays.

- Landscaping Materials. Landscaped areas serve functional and aesthetic purposes. All landscaping design would need to conform to Caltrans design guidelines, as well as the standards and policies contained in local government planning and zoning documents, where applicable. Pervious concrete and other options to the use of asphalt for surface paving should be evaluated, because blacktop absorbs heat. Planting and irrigation systems should be designed to achieve a balance between aesthetics, safety, maintainability, cost effectiveness, and resource conservation (Caltrans, 2008).

Landscaping at bike path entrances and any proposed rest stops would consist of drought-tolerant or native landscaping, along with hardscape materials. Shade trees could be established at each end of the path where municipal water supplies are available and possibly at some designated rest stops depending on the practicality of establishing a water supply for irrigation in isolated areas. Appurtenant structures should be designed to be functional and, where appropriate, artistic or practical. Consideration should be given to use of decorative fencing materials, especially at path

entryways. The first ± 100 yards of the bike path on both ends could be meandered slightly amid attractive landscaping to generate appeal.

- Comfort Stations. Do to the long distance of the proposed HDC Bike Path, it is recommended that comfort stations be considered to provide welcomed stops for those using the path. Amenities at each station could potentially include a restroom facility, drinking fountain, bicycle rack, and ample shade. For security purposes, the comfort station and, in particular, the public restroom, should be placed in a highly visible location even from the perspective of the adjacent freeway. Alternative restroom design would need to be well researched to help ensure public safety.
- Lighting and Signage. Lighting would be provided at all bike path access/egress points, and at any designated rest stops that are built. Bicycle parking areas should be well lit.

Signage would be required all along the route, but particularly at path access/egress locations, near designated rest stops, and along at-grade cross streets. A crosswalk and appropriate signage cautioning pedestrians, cyclists, and motorists at each crossing would be provided. In addition to 'Bike Path' signs, at each path entrance there would be signs outlining bike path rules, including prohibition of motorized vehicles and compliance with the California Vehicle Code, Division 11, Chapter 1, Article 4, Operation of Bicycles, and signs with emergency contact numbers. While distance markers could be incorporated into the proposed project, cyclists would likely be able to see the periodic destination signs on the adjacent freeway.

- Bicycle Parking. Space for bicycle rack and locker parking should be reserved at access/egress locations on both ends of the HDC Bike Path corridor and at designated rest stops. Bicycle parking locations should be selected that are highly visible, are not screened by vegetation or other barriers, and where irrigation water cannot reach.

There are a variety of available design options for bicycle racks; however, parking devices that support the bike frame and accept a variety of locks are recommended. Parking devices that are trip hazards should also be avoided.

- Educational Displays Option. Caltrans projects often incorporate visual displays that generate human interest and are educational. In the High Desert, exhibits could be installed that describe how native plant and animal species have adapted to survive extreme weather conditions. There are also opportunities to highlight Native American peoples that resided on these lands for thousands of years, with emphasis on how they used the desert resources to survive. A similar display could be provided to describe conditions for pioneers that crossed and inhabited the two valleys. Toward the western end of the bike path, where the mountains are more visible, consideration should be given to a display that identifies the name of mountain peaks.
- Technology Stations Option. In support of building a sustainable project in line with the project's purpose and need, consideration should be given to incorporating solar or other renewable energy components into the proposed HDC Bike Path project. For example, solar canopies could be constructed at designated rest stops and even along portions of the path to provide shade while generating energy. Solar panels or small windmills at designated rest stops could possibly be used to generate electric energy to power lights and perhaps even run a pump for groundwater production, if feasible.

Maintenance. The proposed project should be designed with a goal of providing a safe facility that would attract users, while at the same time result in construction of improvements that minimize long-term maintenance requirements and associated costs. Pervious pavement, for example, would provide a paved

surface that minimizes runoff; however, use of these materials may be a concern in desert conditions because regular mechanical vacuum sweeping may be necessary to remove wind-blown particles from surface pores. Use of a thermoplastic striping application lasts longer than paint, thus reducing required maintenance. Composting toilets should be considered for any new designated rest stops with such facilities. Long-life bulbs would be selected for lighting fixtures to minimize maintenance requirements. Further study of methods to appropriately minimize maintenance requirements is recommended.

Regardless of the surfacing material used to construct the HDC Bike Path, the surface would need to be maintained. Periodic sweeping would be required to remove wind-blown sand buildup. Path erosion and other surface damage would need to be repaired. In addition, as with the adjacent freeway, trash pick-up would be required. Designated rest stops would also need to be maintained, including graffiti removal.

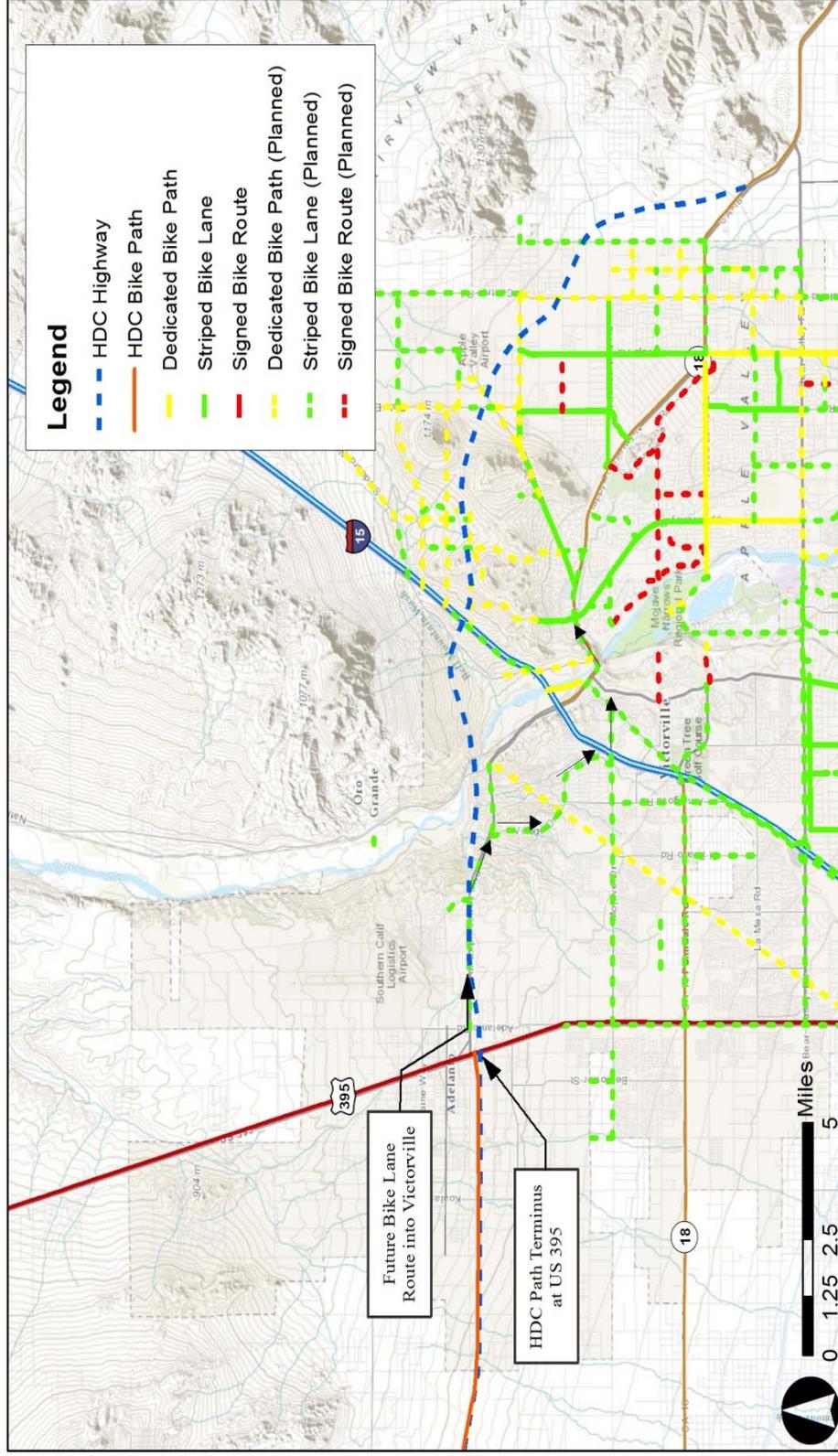
2.3.2 Potential Mid-point and Termini Connections (to municipal bicycle and multi-modal facilities)

Local planning documents within the Victor and Antelope valleys show that existing bicycle facilities within the region are underdeveloped. See Appendix D for the City of Palmdale's Bikeway and Multi-Purpose Trail Plan and Bicycle Facilities, Victor Valley. As shown on these maps, the quantity and connectivity of existing bicycle infrastructure is lacking. Potential linkages with existing and planned facilities are described below. See Section 4.1.9 for a discussion of local government land use policy with regard to non-motorized travel.

East (Victor Valley) Terminus. While there are no existing bicycle facilities near the proposed HDC Bike Path terminus in Adelanto, a future Class II bike lane shown in Figure 2-3 is being planned to extend east on Air Expressway from the intersection with Adelanto Road. From Air Expressway, bicyclists could then take a southerly connection at a proposed bike lane on Village Drive or to North D Street (Old Route 66) for access to the partially completed Mojave Riverwalk Trail into downtown Victorville. HDC bicyclists following this route would then be able to access the planned future bicycle network in the greater Victorville area.

According to the City of Victorville's Non-Motorized Transportation Plan, the city offers a unique combination of waterways and power line ROWs that could be used as a future backbone component of an extensive off-road network for use by bicyclists, joggers, equestrians, and other non-motorized users. The City already has partially implemented a Public Works Department plan to develop a combination of paved and earthen pathways, ultimately providing an 8-mile-long, non-motorized route along the Mojave River from I-15 through downtown to Victor Valley College. The Oro Grande Wash is also within City jurisdiction and could become a central feature of Victorville that would link the Mall of Victor Valley, downtown, as well as parks and schools. The Non-Motorized Transportation Plan also proposes a comprehensive network of Class II striped bike lanes and Class III shared routes to address the lack of east-west connectivity for bicycle riders; improve accessibility over I-15; improve connectivity to neighboring cities; and improve safety for bicycle riders (City of Victorville, 2010).

Figure 2-3. Potential Future HDC Bike Path Connections to Planned
Local Bicycle Facilities in Victor Valley



Lake Los Angeles Access. The HDC Bike Path would provide access to the Lake Los Angeles vicinity, along with scenic nearby buttes and wildlife viewing along Big Rock Wash. This area has a rich history in film dating back to the late 1930s, which could be the subject of an educational/human interest display as described above. Existing food services are located 2 miles north on East 170th Street, which is quite an out-of-direction distance for most bicyclists; however, given the proximity to Lake Los Angeles, the proposed 170th Street interchange would be a likely future location for (a) new highway-dependent business(es) to become established.

West (Palmdale) Terminus. According to the City of Palmdale's Bikeway and Multi-Purpose Trail Plan (City of Palmdale, 2011), bicycle facilities are proposed along several east-west and north-south streets across the east side of the city. As illustrated in Figure 2-4, this plan shows future facilities as follows: Palmdale Boulevard west to 47th Street East; along 50th Street north-south across the city; and Avenues P, Q, and R from 50th Street into the downtown area. At Sierra Highway, bicyclists would be able to connect to the existing Sierra Highway Bike Trail to either go north into Lancaster or south to downtown. In addition, the County of Los Angeles is proposing bike trails that would extend south from Avenue Q parallel with 110th Street East into the Littlerock community. A future County bikeway is also planned to extend southerly from Palmdale Boulevard along Little Rock Wash.

3 OPPORTUNITIES AND CONSTRAINTS

This section of the Bike Path Study discusses opportunities and constraints to constructing the facility across the High Desert in association with a new freeway. These are discussed in greater detail below.

3.1 Opportunities

- Available Public Right-of-Way. Caltrans is planning to purchase ROW for the planned HDC corridor. Because the most of the land is undeveloped open space, acquisition can be accomplished to provide adequate room for the proposed HDC Bike Path.
- Direct Route. The HDC Bike Path would be planned as a relatively direct connection between the cities in the Victor and Antelope valleys, although recreation, rather than commuter or commercial travel, would be the primary use. This would be in marked contrast to the existing situation, which exhibits limited and inconvenient east-west connectivity.
- Level Terrain. The site is relatively flat, as it gradually descends going west from approximately 2,900 ft at Air Expressway/US 395 to approximately 2,635 ft at the Palmdale Transportation Center. These conditions would meet the needs of a wide variety of cyclists, people with disabilities, and other users, while allowing construction of the HDC Bike Path using a minimal amount of grading.
- Few Intersections. With the exception of the proposed corridor to the west of 50th Street East, the proposed HDC Bike Path would traverse sparsely populated desert where crossroads are widely spaced. Those that are crossed are characterized as rural highways with light traffic. Construction of the HDC would create new interchanges with site-specific design characteristics. The HDC Bike Path design would be incorporated into the overall project design.
- Few Conflicts with Utility Infrastructure and Fences. Because the corridor to be established predominantly crosses undeveloped rural desert properties, and the facility would be routed around two small and remote airfields, it is anticipated that the need for major utility and other property relocations can be minimized.
- Uncontaminated Soils. Because the proposed HDC Bike Path would predominantly be constructed across properties that have never been developed, and away from roads where illegal dumping can occur, the likelihood of encountering sites with recognized environmental conditions² is considered to be low in rural areas.
- Excellent Visibility. Because the route would extend straight across relatively level open desert land, there would be no potential hazards associated with sharp turns. The path would also be separated from motorized traffic, and visibility at road crossings would also be good; therefore, the potential for vehicular conflicts would be minimal.

² Defined as “the presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or the material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property (ASTM, 2005).”

- Viewshed. The HDC Bike Path would allow users the opportunity to enjoy viewing desert flora and fauna, including opportunities to see desert wildflowers in early spring. If the bike path were to be constructed along the south side of the proposed freeway, then users could enjoy uninterrupted views of the San Gabriel/San Bernardino mountains across an expansive desert terrain.
- Safe Alternative to Existing Conditions. The proposed project would be a safer option to existing conditions. The path along the California Aqueduct is currently closed to bicycle use, which has been the case for several years. Bicyclists choosing to travel between Victorville and Palmdale using SR-18/SR-38 must contend with high-speed vehicular traffic along a two-lane road with no shoulders. In addition to potential accidents, wind blast from trucks and other vehicles can be a hazard to bicyclists.
- Multi-Modal Options. The proposed HDC Bike Path would allow connections with existing bus service provided by Antelope Valley Transit Authority (AVTA) and Victor Valley Transit Authority (VVTA). AVTA Routes 2 and 3 service the communities east of downtown, extending out to 47th Street East. The Lake LA Express bus line extends east from both Lancaster City Park and Palmdale Transportation Center to Lake Los Angeles. VVTA's Route 32 and 33 both service Air Expressway west of US 395. Should HSR feeder service be incorporated as part of the project, then the opportunity would also exist for bicyclists to access the HDC Bike Path using rail, including recreational bicyclists that may wish to cycle one-way and return via rail, or vice versa.
- State and Local Policy for Multi-Modal Facilities. The proposed HDC Bike Path would be consistent with federal, State, and local policies in support of non-motorized travel. In addition to the aforementioned DD-64, the project would incorporate best practice concepts outlined in U.S. Department of Transportation Policy Statement on Integrating Bicycle and Walking into Transportation Projects. Local agencies within the project area have also developed policies to foster bicycle and pedestrian-friendly environments, as described below in Section 4.1.9.
- Tie-in with Other Planned Bike Facilities. The HDC Bike Path would support the build-out of local jurisdictions' planned bicycle networks. These local networks are described below in Section 4.1.9. The HDC Bike Path could potentially be submitted for consideration as an alternate corridor candidate for the National Bike Route System. According to the Director of Travel Initiatives for the Adventure Cycling Association, National Trails Highway (Old Route 66) through the Victor Valley is being implemented as part of the U.S. Bicycle Route System (Sullivan, personal communication).

3.2 Constraints

- Desert Conditions. Summertime temperatures in the High Desert average above 90 °F and frequently exceed 100 °F. Nighttime winter low temperatures average from the mid- to low-30s °F. These high and low temperatures can pose health hazards for unprepared cyclists and other HDC Bike Path users. Wind is also a concern in the desert, with maximum recorded wind speed gusts of 81 and 84 mph in 2009 and 2007, respectively (SEAOSC, 2010). In particular, it is often challenging to ride from east to west across the desert floor, because as shown in Figure 1-3 prevailing winds are out of the west for the vast majority of the time.
- Remote Areas. The freeway/bike path corridor would cross open desert with extreme temperature conditions, far from emergency service providers and other services, and in an environment

where natural hazards exist, such as rattlesnakes and cacti. Currently, there are no potable water facilities; however, in the future, the project area would be traversed by a freeway, and business services (e.g., gas stations, restaurants) would likely choose to locate at some interchanges.

- Numerous Wash Crossings. In general, the hydrologic regime along the entire corridor exhibits the characteristics of an alluvial fan, with several incised streams and channels that run north across the project alignment. The largest water courses are Little Rock Wash and Big Rock Wash, but numerous crossings of smaller water courses would have to be addressed. As currently envisioned, the HDC Bike Path would be aligned along the north side of the freeway; therefore, to the extent feasible, drainage facilities would be designed to control flows before they cross the path.
- Environmental Issues. Because the proposed freeway/bike path corridor would cross several miles of undisturbed desert habitat, the proposed project would result in adverse environmental impacts requiring mitigation. The proposed project could trigger adverse impacts within the following issue areas: visual aesthetics; agricultural resources; biological resources; cultural resources; geology and soils; hazards and hazardous materials; and hydrology and water quality. See Section 4 and Appendix C of this report for more information.
- Noise. While existing conditions along most of the project corridor can be characterized as quiet, post-construction conditions would change as the future HDC Bike Path would be located adjacent to the new freeway facility and possibly a passenger rail facility. These conditions may be undesirable for some non-motorized path users.
- Ridership. While there are urban destination points on both ends of the proposed HDC Bike Path, the territory in between is sparsely populated. Without major employment centers along the route, it is likely that the facility would be used mainly for recreational purposes. Locally-organized weekend rides tend to occur along the hills around the valley floors where there is some protection from strong winds (Bartlett, personal communication).

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4 ENVIRONMENTAL ISSUES AND PERMITTING

The proposed project, including a bike path component, is subject to State and federal environmental review requirements. Project documentation is currently being prepared in compliance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Caltrans is the lead agency under CEQA. FHWA's responsibility for environmental review, consultation, and any other action required in accordance with applicable federal laws for this project is being carried out by Caltrans under its assumption of responsibility pursuant to Section 6005 of SAFETEA-LU, codified at 23 *United States Code* (U.S.C.) 327(a)(2)(A).

As discussed above, major issue areas to be addressed in the environmental document include visual aesthetics; agricultural resources; biological resources; cultural resources; geology and soils; hazards and hazardous materials; and hydrology and water quality. Specific to analysis of HDC Bike Path impacts, these topics are briefly summarized below.

4.1 Environmental Issues

An Initial Study has been prepared using the Environmental Checklist Form contained in Appendix G of the CEQA Guidelines (AEP, 2013). The checklist, provided in Appendix C of this report, was prepared to identify potential environmental effects of the proposed HDC Bike Path project. It is noted, however, that the bike path would not be constructed without the planned adjacent highway project; hence, all impacts are described on the checklist form with the assumption that the freeway project would also be built. As a result of this review, impacts likely to require mitigation due to bike path construction are expected within the issue areas discussed below.

4.1.1 Aesthetics

The existing project area is rural, mostly undeveloped, and isolated from urbanization, highways, and other major sources of light and glare. The existing overall visual quality of the project site can be characterized as ranging from average to high; however, as described above, the viewshed quality must be considered within the context of the proposed future development within the corridor. The future visual environment would be substantially altered because it would be dominated by the new highway facility combined with a potential future center-median railroad. The new HDC roadway, bridges and other elements would negatively affect visual vividness, intactness and unity. The overall visual impact is characterized as moderate (Caltrans, 2014c).

Because the freeway would be elevated above existing terrain, the bike path should not even be visible from flat desert viewpoints on the opposite (presumably south) side of the freeway. The 10-ft-wide path would clearly be a visible intrusion into a mostly undisturbed desert environment; however, unlike the freeway, the accompanying bike path would not interrupt the viewshed with a massive elevated structure. Existing expansive views of open desert terrain would be obstructed by the future freeway. In this context, the direct impact of the bike path would not be considered significant, and because of its relatively much smaller scale, it would not contribute to cumulative impacts.

Future freeway and potential rail development within the proposed project corridor would introduce new sources of light and glare, whether or not the bike path is built. Because the project site predominantly consists of undeveloped open space, few sensitive land uses would be adversely affected by light or glare associated with the proposed project. The proposed project would be constructed in accordance with

Caltrans and local government design standards and specifications that restrict future lighting to the minimum level necessary to safely illuminate outdoor areas, and ensure that light fixtures are placed to direct light downward to minimize light spillage and incidental glare.

Bike path construction may require removal of some Joshua trees; however, because the trees tend not to occur in clusters within the project corridor, tree removals could be minimized during design by making slight adjustments (i.e., meandering) to the path alignment.

4.1.2 Agricultural Resources

Based on a review of the Farmland Mapping and Monitoring Program of the California Department of Conservation, the proposed HDC Bike Path would traverse Important Farmland (i.e., Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance) between Big Rock Wash and 180th Street East, between 235th Street East and 255th Street East, and at the former Meadowbrook Dairy property at Sheep Creek Road and Parkdale Road (Caltrans, 2014a). Assessor's data typically show that designated agricultural land located outside of a city's planning area is oftentimes under Williamson Act contract, so the affected farmland parcels could be under contract. These impacts should be further assessed to determine significance and develop mitigation, if appropriate. Route options to the proposed HDC alignment have been developed with the intent of minimizing direct loss of some lands in agricultural production.

4.1.3 Biological Resources

The area within the project ROW could potentially support unique, threatened, or endangered species of plants, animals, and their critical habitats. A separate Natural Environment Study (NES) is being prepared for the HDC to address this topic in more detail. While several special-status plant species have been recorded in the proposed project region, most have a low to moderate potential to occur at the site. Joshua tree and yucca species, locally sensitive species protected under local ordinances and the California Desert Native Plants Act, are found within Mojave creosote bush scrub, Mojave mixed woody scrub, Joshua tree woodland, and partially stabilized desert sand field communities. Special-status wildlife species potentially occurring in or around the project area include Mojave ground squirrel (*Spermophilus mohavensis*); desert tortoise (*Gopherus agassizi*); resident birds such as the loggerhead shrike (*Lanius ludovicianus*); nesting raptors such as the red-tailed hawk (*Buteo jamaicensis*), burrowing owl (*Athene cunicularia*), and Swainson's hawk (*Buteo swainsoni*); wintering birds such as the mountain plover (*Charadrius montanus*); reptiles such as the silvery legless lizard (*Anniella pulchra*) and Mojave fringe-toed lizard (*Uma scoparia*); and special-status bats (Sanitation Districts of Los Angeles County, 2005). Given these considerations, further evaluation is required to determine if potentially significant impacts from bike path construction and operation may occur.

The proposed HDC Bike Path project would cross several desert washes. The proposed project could affect riparian habitat associated with the larger drainages, including Big Rock Wash and Little Rock Wash. It is expected that riparian habitat impacts could be reduced through careful route selection to avoid as many trees as possible and by minimizing construction activity within the wash channels. Joshua tree woodland is considered a sensitive natural community and highest inventory priority by the California Department of Fish and Wildlife due to its scarcity and decline throughout its range and because of numerous listed plant and wildlife species that inhabit this community. Bike path construction may require removal/relocation of some Joshua trees; however, these removals could be minimized during design by making slight adjustments to the path alignment. The U.S. Fish and Wildlife Service (USFWS) designated critical habitat for the desert tortoise on February 8, 1994. Field protocol surveys and development of appropriate mitigation to avoid impacts to the tortoise would be required.

A comprehensive wetland assessment for the proposed project corridor is being conducted; it is expected that wetlands found in this desert environment would typically be limited to major desert washes, such as Big Rock Wash and Little Rock Wash. In past studies, the U.S. Army Corps of Engineers (USACE) has indicated that the isolated washes in the Antelope Valley are not considered ‘Waters of the United States,’ as defined in the Clean Water Act; however, ephemeral washes are considered ‘Waters of the State’ subject to State conservation regulations. Should Waters of the State be located within the project corridor, they would be delineated and described in a wetland delineation report to be prepared by a qualified biologist.

The proposed HDC project would involve establishment of fenced ROW to enclose freeway and potential railroad improvements. This new above-grade facility would create a major north-south obstruction to wildlife movement. With input from project biologists, this issue would be addressed through project design to allow animal passage at identified wildlife crossing areas. In certain locations, larger culvert sizes would be necessary to provide access for large animals. The bike path itself would not be a hindrance to animals that wish to cross north-to-south; however, this issue should be further assessed to determine whether cumulative impacts would occur.

4.1.4 Cultural Resources

The High Desert region has a long history of human habitation. Native American tribes lived throughout the region, using the study area for hunting and gathering and as travel routes (City of Adelanto, 1994). As reported in the *Archaeological Survey Report* (Caltrans, 2013a) for the project, 43 archaeological resources were encountered during a survey of the Area of Potential Effects (APE). This included 28 previously recorded sites and 15 newly located resources. Thirteen other previously recorded sites have been destroyed by development. Of the 43 cultural resources, eight are prehistoric archaeological sites and three are multi component prehistoric historical sites. The prehistoric archaeological sites are primarily lithic scatters; however, three large potentially multi-component sites were found (CA-SBR-66, CA-SBR-182 and CA-SBR-12336).

Historic resources are evaluated in the *Historical Resources Evaluation Report* (Caltrans, 2013b) for the project. There are 16 historical archaeological sites, 13 historic-era built environment resources, one historic-era ranch, and two historical isolates. Twenty-five of these historic-era cultural resources have been evaluated and determined to be Not Eligible for the NRHP, including the historic components of the three multicomponent sites. An additional three of the historic-era cultural resources and two historical isolates are exempt from evaluation under Attachment 4 of the Programmatic Agreement. While five historic period resources are possibly eligible for the National Register of Historic Places, only one historic property crosses the proposed bike path alignment. This resource, the SCE Kramer-Victorville Power Lines and Towers (CA-SBR-10316H, P-36-010316), has been determined to no longer meet any of the National Register criteria for ranking because the historic towers and transmission lines have been removed and replaced with modern structures and materials (Caltrans, 2014d).

4.1.5 Paleontological Resources

Record searches for a more recent study of the Palmdale region found fossils of 38 different species previously recovered from 14 different localities in Pleistocene or Quaternary older alluvium, Harold Formation, Anaverde Formation, and Punchbowl Formation sediments. These fossil localities yielded lizards, snakes, birds, rabbits, skunks, gophers, rats, mice, mammoth, mastodon, camels, horse, oak, pine, cottonwood, avocado, squaw apple, willow, and sycamore (CEC, 2008). Evaluation of the potential project effects on paleontological resources was conducted by Caltrans paleontologists in the *Paleontological Identification Report/Paleontological Evaluation Report for the High Desert Corridor/SR-138 Widening Project from SR-14 to SR-18* (Caltrans, 2014b). This report concludes that

four Holocene to Pleistocene or Pleistocene formations within the project area have been classified as ‘high potential’ areas for containing significant non-renewable fossiliferous resources.

4.1.6 Geology and Soils

The San Andreas Fault and the Cemetery Fault (a major fault trace of the San Andreas system) cross in a northwest to southeast direction at the base of the mountains in the vicinity of Pearblossom Highway (DOC, 1979), while the Llano Fault is parallel with and north of the San Andreas Fault near the community of Llano. In San Bernardino County, major faults include the Mirage Valley and Blake Ranch faults to the north of the HDC alignment, Helendale and Lenwood-Lockhart faults to the northeast, and Cleghorn and North Frontal faults to the southeast (Caltrans, 2012b). Potential seismic effects on the proposed bike path component of the HDC project include ground shaking, liquefaction, and seismic settlement. Intense ground shaking during an earthquake is considered the primary risk of potential future structural damage to the bike path. The potential impacts associated with ground shaking would vary greatly, depending on the fault on which the earthquake occurs, the distance of the earthquake epicenter, and the magnitude and duration of the earthquake episode. For the proposed project, the risk to cyclists and other users of the path is considered low, given that there would be very few structures involved.

Liquefaction occurs when loose soils lose their shear strength and behave as a liquid when subjected to strong, sustained ground shaking during an earthquake. According to maps developed by the California Department of Conservation (DOC, 2003), the proposed HDC Bike Path would cross several miles of land that may be susceptible to liquefaction. These areas, within the influence of Big Rock Wash and Little Rock Wash, are considered to have geological, geotechnical, and/or groundwater conditions that indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required. For the segments of the HDC alignment in San Bernardino County, the liquefaction potential is considered to be unlikely due to absence of groundwater and the medium-dense to dense nature of the subsurface soils (Caltrans, 2012b). These potential impacts would need to be further studied by a professional geologist.

Seismic settlement occurs when strong ground shaking allows sediment particles to become more tightly spaced, thereby reducing existing pore space. While the potential for this type of subsidence has not been determined, desert basin areas containing unconsolidated, relatively fine-grained sediments are generally considered to be potentially susceptible to subsidence. The project would incorporate geotechnical study recommendations into the design, as applicable, and it would include professional oversight to meet all applicable federal, State, and city seismic design criteria. Given these considerations, no significant adverse effects associated with strong ground motion are anticipated.

4.1.7 Hazards and Hazardous Materials

Records searches were conducted to determine whether the proposed project corridor traverses any sites contaminated with hazardous waste, including land that is listed under Government Code Section 65962.5 (Cortese list). Within the Los Angeles County segments of the alignment, one parcel in Llano is identified as a significant environmental concern requiring additional (Phase II) investigation. There are additional residential parcels and one commercial/industrial property that are considered to be a potential hazardous waste concern (Caltrans, 2013c). According to the Initial Site Assessment prepared by District 8 for San Bernardino County (Caltrans, 2011) there are nine sites within the proposed footprint which may require additional environmental assessment prior to property acquisition. Groundwater may need to be tested for contaminants if discharge is required during bridge construction in the wash area between 140th Street and 150th Street East. Prior to any demolition of old buildings, they should be surveyed for asbestos and lead paint. Should encroachment into contaminated sites occur, appropriate procedures would be followed to provide adequate protection to workers and the general public.

4.1.8 Hydrology and Water Quality

The proposed 41-mile-long corridor through the study area would create approximately 50 acres of impervious surface overlaying primarily undeveloped land. The increased area of impervious surfaces would be small in comparison to the size of the watershed. As a result of the increased impervious area, a slight increase in runoff would be exhibited within the various watersheds crossed by the corridor. Caltrans' HDM (see Appendix B of this study) requires that 100 percent of potential runoff from new impervious surface areas be treated before offsite discharge. Because the soils are relatively pervious and groundwater is relatively deep, the installation of infiltration basins or detention basin facilities is practical. In this way, the proposed drainage system would offset the potential increase in flow that could occur due to increases in impervious surfaces.

Design, construction, and operation of the HDC Bike Path would be managed in accordance with applicable federal, State, and local water quality standards. As described in the Caltrans Storm Water Management Plan (SWMP), BMPs would be designed and implemented to reduce the discharge of pollutants from the storm drain system to the maximum extent practicable. Caltrans' SWMP, Storm Water Quality Handbooks, and District Directive 20 address storm water management and would apply, as appropriate, to construction and operation of the proposed project. The proposed HDC Bike Path would also be subject to the requirements of Caltrans' existing National Pollutant Discharge Elimination System (NPDES) permit (Order No. 2012-0011-DWQ, NPDES No. CAS000003), which prescribes the use of BMPs to minimize erosion to the maximum extent practicable.

The proposed HDC Bike Path project would involve clearing and grubbing and grading. With appropriate controls, construction activities would not result in significant water quality impacts due to erosion and siltation in the affected Mojave River and Antelope Valley watersheds. Erosion and siltation potential in the affected drainages would be increased during and after construction; however, in accordance with the statewide General Permit for Storm Water Discharges Associated with Construction, the proposed project would incorporate all applicable construction site BMPs to minimize potential loss of topsoil and/or soil erosion. In accordance with Caltrans' Stormwater Management Plan, an assessment of onsite storm water flows must be conducted and treatment BMPs included in the project design to control the discharge of pollutants to storm drainage systems and receiving waters.

Bridges are proposed over the deeper channels such as Turner Wash, Big Rock Wash, and Little Rock Wash. Cross culverts are proposed at the other waterways that pass the project alignment, including Mescal Creek and Fremont Wash. The crossings would be designed to minimize impacts to the upstream and downstream water surface, flow velocities, and overall streambed and embankment configurations. According to the Hydrology and Hydraulics Report (Parsons, 2014), the proposed project would result in only minor changes to the existing drainage pattern within the planned freeway corridor. In addition, BMP controls would be applied so the proposed project would not result in substantial erosion or downstream siltation. Assuming compliance with Caltrans and local requirements for temporary and permanent storm water controls, it is concluded that the proposed project would not result in substantial erosion or associated loss of top soil.

4.1.9 Land Use and Planning

Caltrans DP-22, "Director's Policy on Context Sensitive Solutions," supports an approach that involves and integrates community goals in the planning, design, construction, and maintenance processes, including the accommodation of bicyclist and pedestrian needs. In this regard, the proposed HDC Bike Path project would be consistent with and complement the goals and policies outlined in local government planning documents. These goals and policies are discussed below by jurisdiction.

City of Adelanto. The City's General Plan (City of Adelanto, 1994) does not contain goals and policies for bicycle facilities. The Circulation Element of the General Plan does contain an implementation strategy stating that "all major roadways shall contain adequate ROWs to allow for the implementation of sidewalks and bikeways. It is also a goal of the City to establish a trails network within open space areas that are part of the land use design of the General Plan." The proposed HDC Bike Path project would be consistent with the statement about providing adequate ROWs. It should also complement the goal of establishing a trails network.

Town of Apple Valley. The Town of Apple Valley's General Plan Circulation Element and Park and Recreation Element contain several goals and policies intended to facilitate the use of non-motorized transportation. These elements require implementation of a coordinated and connected bicycle lane and recreational trails (i.e., suitable for bicycles, equestrians, and pedestrians) network, including investigation into the practicality of using flood control channels where safety issues can be accommodated (SANBAG, 2011). The proposed HDC Bike Path project would be consistent with the Town of Apple Valley's General Plan.

City of Hesperia. Transportation strategy outlined in the City's General Plan (City of Hesperia, 2011) Circulation Element fosters non-motorized modes of transportation. The Element contains policy in support of: developing a "safe, efficient, convenient and attractive transportation system" (Goal CI-1); encouraging "alternative modes of transportation including bus, bicycle, pedestrian, and equestrian" (Policy CI-1.11); and creating "opportunities for...establishment of interconnected trail systems throughout the community" (Policy CI-1.13). The proposed HDC Bike Path project would be consistent with the City of Hesperia's General Plan.

City of Victorville. With regard to bicycle facilities, the City's General Plan (City of Victorville, 2008) emphasizes development of an efficient multi-modal transportation network, including an objective to "complete the non-motorized components of the Circulation Plan by 2020." The City's Non-motorized Transportation Plan is described in Section 2.3.2 above. The proposed HDC Bike Path project would be consistent with the City of Victorville's General Plan.

County of San Bernardino. The County's General Plan (County of San Bernardino, 2012) emphasizes a functional, safe, and convenient transportation system, including public transit and trails for bicycles, pedestrians, and horses (Goal CI-1). The Plan's Circulation and Infrastructure Element identifies safety and access as two major issues involving bicycle usage, both of which would be addressed by the proposed HDC Bike Path. Policy CI.3.1 encourages the reduction of automobile usage by...(3) reducing the number of trips and providing connectivity through pedestrian and bicycle paths. Goal CI.6 encourages and promotes greater use of non-motorized means of personal transportation. There are several other goals and policies in the General Plan that would be furthered by the proposed HDC Bike Path project. The County's Non-motorized Transportation Plan (SANBAG, 2011) outlines ways to integrate and implement a countywide bike path and trails system.

City of Palmdale. The City's General Plan (City of Palmdale, 1993) Circulation Element, while old, encourages use of non-vehicular transportation throughout the planning area (Goal C3). Policy under this goal states that land uses should be arranged to increase the opportunity to utilize bikeways. Other policies address promotion of bicycle accessibility and adoption of a bikeway plan to include a comprehensive network for bicycles. The Parks, Recreation, and Trails Element promotes bicycling as an important mode of transportation and recreation. This element establishes criteria in designating bikeways and requires exploration of funding mechanisms to implement the bikeway plan. See Appendix D for the City of Palmdale's Bikeway Plan, as revised in 2011.

City of Lancaster. Policy 10.2.4 and 14.4.3 of the City’s General Plan (City of Lancaster, 2009) facilitates the use of bicycles as an alternative form of transportation, as well as a form of recreation...by providing appropriate facilities for bicycle riders. Policy 14.4.2 also promotes the use of alternative modes of transportation through the development of convenient and attractive facilities that support and accommodate the services. The General Plan requires the adoption of a Master Plan of Trails, including bicycle ROWs that would integrate with the urban and rural trails and provide additional access.

County of Los Angeles. The County General Plan (County of Los Angeles, 2012a) Mobility Element is supplemented by the Bicycle Master Plan (County of Los Angeles, 2012b). According to the General Plan, the County is committed to improving the environment to allow increased alternative transportation uses. The plan says there is a need for designated path construction for bicycle users given a general lack of public awareness and the safety concerns associated with road sharing. Goal M-2 of the Mobility Element advocates “interconnected and safe bicycle and pedestrian friendly streets, sidewalks, paths, and trails that promote active transportation and transit use.” The proposed HDC Bike Path project would be consistent with this and other goals and policies contained in the General Plan. The Bicycle Master Plan provides policy guidance for building a comprehensive bicycle network throughout the unincorporated areas.

4.1.10 Noise

Construction noise would be generated by diesel engine-driven construction equipment used for site preparation and grading, loading, unloading, and placing materials and paving. Diesel engine-driven trucks also would bring materials to the site and remove the spoils from excavation. Because of the mostly rural environment associated with the proposed HDC Bike Path, the existing noise environment within the area can qualitatively be characterized as quiet; however, because it is assumed that the HDC freeway would be constructed prior to bike path operation, the noise environment with the proposed freeway would be substantially louder than under current conditions. There are also very few residential or other occupied structures located along the project corridor. Addressed in this context, temporary bike path construction noise impacts should be less than significant; however, bike path alignment has not been determined, and based on further analysis, noise-reduction controls during construction could possibly be required in the vicinity of Littlerock High School and other receptors. Operational noise for the joint operation of the HDC and bike path would create elevated noise levels for bike path users. Under applicable FHWA/Caltrans noise impact guidance, noise abatement would not be provided solely for transient receptors, such as bicyclists.

4.2 Regulatory Permitting

As described below, several environmental discretionary permits would be required for the proposed HDC Bike Path project. This list is considered preliminary. A more detailed review of required permits would be prepared as part of the PA/ED phase of project development.

4.2.1 Federal Permits

Clean Water Act. Any person or public agency proposing to discharge dredged or fill material into ‘Waters of the United States,’ including jurisdictional wetlands, must obtain a permit from USACE. A comprehensive wetland assessment for the proposed project corridor will be conducted; however, it is expected that any wetlands found in this desert environment would be limited to major desert washes, such as Big Rock Wash and Little Rock Wash. In past studies, USACE has indicated that the isolated washes in the Antelope Valley are not considered ‘Waters of the United States,’ as defined in the Clean Water Act.

Endangered Species Act. The Endangered Species Act (ESA) provides for the conservation of species that are endangered or threatened throughout all or a significant portion of their range, and the conservation of the ecosystems on which they depend. Under Section 7 of the ESA, all federal agencies are required to ensure, in consultation with USFWS, that the proposed action they fund, authorize, or carry out does not jeopardize the existence of a listed species or adversely modify or destroy critical habitat.

The proposed project would have federal nexus through federal funding and the need for federal permits; hence, a biological assessment (BA) would need to be prepared to evaluate potential effects of the project to threatened or endangered species listed under the ESA. All ESA-listed species and designated critical habitat that may occur within the vicinity of project disturbance areas would be addressed in the BA.

Consultation with USFWS is initiated by USACE during the Section 404 Permit process. The process typically begins as an informal consultation to allow USFWS to review the BA. If USFWS and Caltrans determine that the project “may affect” listed species or critical habitat, formal consultation is initiated. Once the application is deemed complete, there is a 90-day period for USFWS to prepare a Section 7 Biological Opinion (BO).

National Historic Preservation Act. Section 106 of the National Historic Preservation Act requires federal agencies to review all actions that may affect a property listed, or eligible for listing, on the National Register of Historic Places (NRHP). If a property may be affected, the federal agency is required to consult with the State Historic Preservation Officer (SHPO). The proposed project would require consultation under Section 106 if it has federal involvement and has the potential to affect a property listed on the NRHP, or a property eligible for listing. Caltrans would consult with the SHPO and other agencies and interested parties to resolve any adverse effects on historic properties, which would then lead to the preparation and approval of a Memorandum of Agreement.

4.2.2 State Permits

California Fish and Game Code Sections 1600-1616. The California Fish and Game Code mandates that “it is unlawful for any person to substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by the Department, or use any material from the streambeds, without first notifying the department of such activity.” California Department of Fish and Wildlife (CDFW) jurisdiction includes ephemeral, intermittent, and perennial watercourses, including dry washes, and lakes characterized by the presence of (1) definable bed and banks and (2) existing fish or wildlife resources. Furthermore, CDFW jurisdiction extends to riparian habitat and may include oak woodlands in canyon bottoms. This regulation takes the form of a requirement for a Lake or Streambed Alteration Agreement.

California Fish and Game Code Sections 2050 to 2097. The California Endangered Species Act (CESA) prohibits the take of plant and animal species designated by the Fish and Game Commission as either threatened or endangered in the State of California. Sections 2081(b) and (c) of the CESA directs CDFW to issue incidental take permits for a State-listed threatened or endangered species if specific criteria are met. These criteria include minimization and full mitigation of the impacts, mitigation that is roughly proportional in extent to the impact, and adequate funding to implement and monitor the mitigation. When the species are both State- and federally listed, as is typical, an expedited request for consistency with the federal BO may be issued through a request for 2080.1 consistency determination.

Clean Water Act, Section 401. Section 401 of the Clean Water Act requires that any applicant for a federal permit for activities that involve a discharge to ‘Waters of the United States,’ shall provide the federal permitting agency a certification from the State that the discharge would comply with the

applicable provisions under the Clean Water Act. Therefore, before USACE would issue a Section 404 permit, applicants must apply for and receive a Section 401 Water Quality Certification or waiver from the Lahontan Regional Water Quality Control Board (RWQCB).

Clean Water Act, Section 402. Section 402(p) prohibits the discharge of pollutants to ‘Waters of the United States’ from any point source unless the discharge is in compliance with an NPDES permit. The NPDES Program is a federal program that has been delegated to the State of California for implementation through the RWQCBs.

Discharges of storm water associated with construction activity (i.e., storm water discharges) that result in the disturbance of 1-acre or more of total land area or which are part of a larger common area of development must comply with the General Storm Water Permit for Construction Activities (Order No. 2012-0011-DWQ, NPDES No. CAS000003). Dischargers who fail to obtain coverage under this permit will be in violation of the Clean Water Act and the California Water Code. Because the project would cause disturbance of more than 1-acre, it must comply with the General Storm Water Permit for Construction Activities.

The proposed project would need to be constructed in compliance with requirements of the Los Angeles County Municipal Stormwater Permit (Order No. 01-182, NPDES Permit No. CAS004001, as amended by Order No. R4-2007-0042) and the County of San Bernardino Municipal Stormwater Permit (Order No. R8-2010-0036, NPDES Permit No. CAS618036). These permits require that Standard Urban Storm Water Mitigation Plans be developed during the PA/ED phase to incorporate permanent BMPs into the project.

Porter-Cologne Act. The RWQCB regulates actions that would involve “discharging waste, or proposing to discharge waste, with any region that could affect ‘Waters of the State’.”³ Under the Porter-Cologne Act, the RWQCB regulates all such activities, as well as dredging, filling, or discharging materials into ‘Waters of the State,’ that are not regulated by USACE due to a lack of connectivity with a navigable water body. The RWQCB may require issuance of Waste Discharge Requirements (WDR) for activities such as dredging, filling, or discharging materials into ‘Waters of the State’ that are not regulated by USACE due to a lack of connectivity with a navigable water body. The State Water Resources Control Board issued Water Quality Order No. 2004-004-DWQ, which established a statewide General WDR for projects that involve dredge or fill discharges of (1) less than 0.2-acre and 400-linear feet for fill and excavation discharges, and (2) not more than 50 cubic yards for dredging discharges. Projects that exceed the General WDR thresholds are authorized under a standard WDR, which requires approval by the Lahontan RWQCB.

Section 670, Streets and Highway Code. All projects entailing work within, under, or over a State highway ROW require an encroachment permit from Caltrans. Caltrans issues these permits to: (1) ensure that the proposed encroachment is compatible with the primary uses of the highway; (2) ensure the safety of both the permittee and the highway users; and (3) protect the State’s investment in the highway facility.

4.2.3 Local Permits

South Coast Air Quality Management District, Rule 1166. It is possible that contaminated soil may be encountered during construction activities. Rule 1166 establishes requirements to control the emission of

³ Water Code 13260(a), pursuant to provisions of the State Porter-Cologne Act. *Waters of the State* are defined as “any surface water or groundwater, including saline waters, within the boundaries of the state” (Water Code 13050 (e)).

volatile organic compounds (VOCs) from excavating, grading, handling, and treatment of VOC-contaminated soil.

Los Angeles County Significant Ecological Areas. The proposed project corridor in Los Angeles County traverses lands that are currently proposed for designation as the Antelope Valley Significant Ecological Area (SEA). As a component of the Los Angeles County Conservation/Open Space Element, the SEA Program is a resource identification tool that indicates the existence of important biological resources. SEAs are not preserves but areas where the County deems it important to facilitate a balance between limited development and resource conservation. Limited development activities are reviewed closely in these areas where site design is a key element in conserving fragile resources such as streams, oak woodlands, and threatened or endangered species and their habitat (County of Los Angeles, 2009).

County Flood Control Permits. Permits are required from the individual Public Works Departments for Los Angeles and San Bernardino counties for work affecting flood channels and existing storm drains under their jurisdictions.

City Permits. Removal of Joshua trees and other specified native tree and cactus species would trigger permits issued by both counties with jurisdiction under the California Desert Native Plants Act, California Food and Agricultural Code, Division 23. Joshua trees also receive protection under the City of Palmdale's Municipal Code, Chapter 14.04, Native Desert Vegetation Ordinance.

Further review of these and other local government policies and ordinances for the protection of biological resources is necessary to determine if the proposed bike path component of the HDC would result in any conflicts.

4.3 Public Outreach Considerations

A public outreach program should be conducted as part of the development and environmental review of the HDC. A targeted portion of this program should be aimed at increasing public awareness of the HDC Bike Path facility. Bike path promotion at the local government level, once it becomes operational, would also be important if it is to draw the desired numbers of cyclists. Various aspects of the bike path would be attractive to cyclists and other non-motorized users. These attractions would include direct connection between bike route networks in Victor Valley communities and Antelope Valley communities as shown on Figures 2-3 and 2-4; seasonal outings to view and photograph nature, including seasonal desert wildflowers; and bike rally events. As stated above, the HDC Bike Path could potentially be submitted for consideration as an alternate corridor candidate for the National Bike Route System (Adventure Highway Association and AASHTO, 2013).

Local government agencies in Victor Valley and Antelope Valley would be the most likely to benefit from bike path promotion, especially to groups visiting from outside the region. In this regard, targeted brochures and specialized advertising outreach to bicycle clubs and environment/nature organizations would be foremost. The above-recommended project amenities would enhance the bike path's interest for these types of groups. Incorporating public art into the proposed project should also be considered to increase interest.

Proactive bike path promotion to the community should also be emphasized. This can be handled in a variety of educational formats throughout the year and should be aimed at children and adult cyclists of all skill levels. For example, community bike rides can be organized to incorporate several stops, each with a featured speaker, perhaps a photographer, naturalist, historian, or Native American community representative. Community bike rides hosted by a city (or cities) should always incorporate an education component before the ride. Such a lesson would typically involve proper helmet fitting, "Air, Brake,

Chain (ABC)” inspections, practicing safe riding in a group, hand signal use, sharing the road, and other safe cycling skills.

Maps and information on bike path programs and events should be posted on each city’s Web site. Maps of the HDC Bike Path should be made available at all events, as well as at libraries, community centers, bike shops, and upon request. Local agencies can host booths on Earth Day and at other events to provide information and distribute materials. The booths would focus on informing the public of all ages about local bikeway and trail facilities, upcoming projects and events, helmet use, and sharing the road. There are typically giveaway items at the booths, such as maps and safety brochures.

It is advisable to work closely with local bicycle organizations during planning, design, and marketing of the proposed HDC Bike Path. In the Palmdale/Lancaster area, the AV High Desert Cyclists conducts organized rides every weekend (i.e., Saturday and Sunday), all year around. They also have two annual special events: Fall Memorial Century (100-mile ride or 63-mile and 25-mile optional distances) and a 90-mile ride called ‘Ride to the Beach.’

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5 RECOMMENDATIONS AND CONCLUSION

5.1 Bike Path Recommendations

The following preliminary recommendations are provided with regard to developing a bike path along the HDC:

1. Construct a two-way, Class I bike facility in accordance with Caltrans, Metro, and SANBAG standards while giving due consideration to constructing the bike path along the south side of the freeway to take advantage of mountain views.
2. Provide designated rest stop improvements every 5 to 10 miles along the corridor to provide relief for riders and other non-motorized path users. Amenities to be considered at each station could include a restroom facility, drinking fountain, bicycle rack, and ample shade.
3. The bike path would provide existing and future connections to the north and south, as well as links to local and regional transit, as well as existing and planned bicycle facility connections at or near path termini.
4. Plan and design the bike path for the safety and security of all path users, with particular attention to site layout and design of designated rest stops, selecting bike racks and other products that do not present hazards, and defensible restroom design (if applicable).
5. In support of building a sustainable project in line with the project's purpose and need, consideration should be given to incorporating solar and/or other renewable energy components into the proposed project.
6. Consider including educational displays at intervals along the bike path to increase the path's ridership potential and provide opportunities for recreationists to learn about the High Desert physical and cultural environment.
7. Once the bike path is in operation, encourage local governments to develop and implement a public outreach program to increase public awareness of the new bike path.

5.2 Conclusion

Because the HDC Bike Path would be constructed between two urban areas more than 40 miles apart, with very little business activity between these destinations, it is concluded that the demand for commuter use of the path between Adelanto/Victorville and Palmdale/Lancaster would be minimal. There would likely be some undetermined demand for bicycle commuter use of the path in the east Palmdale region. However, there are several examples of long bicycle paths/trails in California that are predominantly used for recreation purposes, which would be consistent with the HDC application.

A major consideration for the proposed HDC Bike Path is that it would represent the only direct east-west Class I bike facility between the Victor and Antelope valleys. A new bike path would provide a safe option to use of existing state highways and local roads that were not designed for bicycles and can be hazardous according to local cyclists (Bartlett and Walsh, personal communication).

The proposed HDC Bike Path could potentially be used in association with future annual bicycle events staged out of Palmdale, including AV High Desert Cyclists' Fall Memorial Century and Amgen's Tour of California. The HDC Bike Path could also be submitted for consideration as an alternate corridor candidate for the Adventure Cycling Association's National Bike Route System.

It is expected that bike path usage would likely be higher in areas closer to urbanization on both ends of the corridor, where senior citizens and parents with children are most likely to venture. Bike path use for bicycling and other purposes would also likely exhibit seasonal variation, with much greater demand during the cooler months and short-duration spring flowering period, for example, compared with during hot summer months. Frequently strong westerly winds may be a deterrent for riders going from east to west (Bartlett, personal communication). Ultimately, bike path usage would depend on factors such as how well the path is connected to the existing and planned transit networks, what path amenities are offered, how safe people feel, and how well the facility is marketed to the public.

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APPENDIX A

SITE PHOTOGRAPHS

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Southwest view from US 395 / Air Expressway intersection



City Hall, Adelanto, from Air Expressway Boulevard



Northeast view of power line crossing from Koala Street / Air Expressway intersection



Northwest view across Meadowbrook Dairy from Sheep Creek Road / Parkdale Road



View toward west from 240th Street East at East Palmdale Boulevard



North view toward Lake Los Angeles from 170th Street East near East Palmdale Boulevard



Big Rock Wash during early spring, view toward south



Cottonwood trees at Big Rock Wash



View south, Longview Road near East Palmdale Boulevard



View west, East Palmdale Boulevard at Longview Road



Littlerock High School Football Field from 110th Street East, view toward southwest



View South along 90th Street East from vicinity of East Avenue P-8



Little Rock Wash channel during early spring, view toward south



Little Rock Wash channel during early spring, view toward north



Southwest view along East Avenue P-8 from 50th Street East



West view along Avenue P-8 East alignment from 20th Street East



Southeast view at Avenue P-8 East from 10th Street East



Palmdale Transportation Center

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APPENDIX B

CALTRANS HIGHWAY DESIGN MANUAL CHAPTER 1000

BIKEWAY PLANNING AND DESIGN

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CHAPTER 1000 BICYCLE TRANSPORTATION DESIGN

Topic 1001 - Introduction

Index 1001.1 – Bicycle Transportation

The needs of non motorized transportation are an essential part of all highway projects. Mobility for all travel modes is recognized as an integral element of the transportation system. Therefore, the guidance provided in this manual complies with Deputy Directive 64-Revision #1: Complete Streets: Integrating the Transportation System. See AASHTO, “Guide For The Development Of Bicycle Facilities”.

Design guidance for Class I bikeways (bike paths), Class III bikeways (bike routes) and Trails are provided in this chapter. Design guidance that addresses the mobility needs of bicyclists on all roads as well as on Class II bikeways (bike lanes) is distributed throughout this manual where appropriate.

See Topic 116 for guidance regarding bikes on freeways.

1001.2 Streets and Highways Code References

The Streets and Highways Code Section 890.4 defines a “bikeway” as a facility that is provided primarily for bicycle travel. Following are other related definitions, found in Chapter 8 Nonmotorized Transportation, from the Streets and Highway Code:

- (a) Section 887 -- Definition of nonmotorized facility.
- (b) Section 887.6 -- Agreements with local agencies to construct and maintain nonmotorized facilities.
- (c) Section 887.8 -- Payment for construction and maintenance of nonmotorized facilities approximately paralleling State highways.
- (d) Section 888 -- Severance of existing major non motorized route by freeway construction.

- (e) Section 888.2 -- Incorporation of non motorized facilities in the design of freeways.
- (f) Section 888.4 -- Requires Caltrans to budget not less than \$360,000 annually for non motorized facilities used in conjunction with the State highway system.
- (g) Section 890.4 -- Class I, II, and III bikeway definitions.
- (h) Section 890.6 - 890.8 -- Caltrans and local agencies to develop design criteria and symbols for signs, markers, and traffic control devices for bikeways and roadways where bicycle travel is permitted.
- (i) Section 891 -- Local agencies must comply with design criteria and uniform symbols.
- (j) Section 892 -- Use of abandoned right-of-way as a nonmotorized facility.

1001.3 Vehicle Code References

- (a) Section 21200 -- Bicyclist's rights and responsibilities for traveling on highways.
- (b) Section 21202 -- Bicyclist's position on roadways when traveling slower than the normal traffic speed.
- (c) Section 21206 -- Allows local agencies to regulate operation of bicycles on pedestrian or bicycle facilities.
- (d) Section 21207 -- Allows local agencies to establish bike lanes on non-State highways.
- (e) Section 21207.5 -- Prohibits motorized bicycles on bike paths or bike lanes.
- (f) Section 21208 -- Specifies permitted movements by bicyclists from bike lanes.
- (g) Section 21209 -- Specifies permitted movements by vehicles in bike lanes.
- (h) Section 21210 -- Prohibits bicycle parking on sidewalks unless pedestrians have an adequate path.
- (i) Section 21211 -- Prohibits impeding or obstruction of bicyclists on bike paths.
- (j) Section 21400 -- Adopt rules and regulations for signs, markings, and traffic control devices for roadways user.

- (k) Section 21401 -- Only those official traffic control devices that conform to the uniform standards and specifications promulgated by the Department of Transportation shall be placed upon a street or highway.
- (k) Section 21717 -- Requires a motorist to drive in a bike lane prior to making a turn.
- (m) Section 21960 -- Use of freeways by bicyclists.
- (n) Section 21966.-- No pedestrian shall proceed along a bicycle path or lane where there is an adjacent adequate pedestrian facility.

1001.4 Bikeways

(1) Role of Bikeways

Bikeways are one element of an effort to improve bicycling safety and convenience - either to help accommodate motor vehicle and bicycle traffic on the roadway system, or as a complement to the road system to meet the needs of the bicyclist.

Off-street bikeways in exclusive corridors can be effective in providing new recreational opportunities, and desirable transportation/commuter routes. Off-street bikeways can also provide access with bridges and tunnels which cross barriers to bicycle travel (e.g., freeway or river crossing). Likewise, on-street bikeways can serve to enhance safety and convenience, especially if other commitments are made in conjunction with establishment of bikeways, such as: elimination of parking or increased roadway width, elimination of surface irregularities and roadway obstacles, frequent street sweeping, established intersection priority on the bike route street as compared with the majority of cross streets, and installation of bicycle-sensitive loop detectors at signalized intersections.

(2) Decision to Develop Bikeways

Providing an interconnected network of bikeways will improve safety for all users and access for bicycles. The development of well conceived bikeways can have a positive effect on bicyclist and motorist behavior. In addition, providing an interconnected network of bikeways along with education and enforcement

can improve safety and access for bicyclists. The decision to develop bikeways should be made in coordination with the local agencies.

Topic 1002 - Bikeway Facilities

1002.1 Selection of the Type of Facility

The type of facility to select in meeting the bicyclist's need is dependent on many factors, but the following applications are the most common for each type.

(1) Shared Roadway (No Bikeway Designation).

Most bicycle travel in the State now occurs on streets and highways without bikeway designations and this may continue to be true in the future as well. In some instances, entire street systems may be fully adequate for safe and efficient bicycle travel, where signing and pavement marking for bicycle use may be unnecessary. In other cases, prior to designation as a bikeway, routes may need improvements for bicycle travel.

Many rural highways are used by touring bicyclists for intercity and recreational travel. It might be inappropriate to designate the highways as bikeways because of the limited use and the lack of continuity with other bike routes. However, the development and maintenance of 4-foot paved roadway shoulders with a standard 4 inch edge line can significantly improve the safety and convenience for bicyclists and motorists along such routes.

(2) Class I Bikeway (Bike Path).

Generally, bike paths should be used to serve corridors not served by streets and highways or where wide right of way exists, permitting such facilities to be constructed away from the influence of parallel streets. Bike paths should offer opportunities not provided by the road system. They can either provide a recreational opportunity, or in some instances, can serve as direct high-speed commute routes if cross flow by motor vehicles and pedestrian conflicts can be minimized. The most common applications are along rivers, ocean fronts, canals, utility right of way, abandoned railroad right of way, within school campuses, or within and between parks. There may also be situations where such

facilities can be provided as part of planned developments. Another common application of Class I facilities is to close gaps to bicycle travel caused by construction of freeways or because of the existence of natural barriers (rivers, mountains, etc.).

- (3) *Class II Bikeway (Bike Lane)*. Bike lanes are established along streets in corridors where there is significant bicycle demand, and where there are distinct needs that can be served by them. The purpose should be to improve conditions for bicyclists in the corridors. Bike lanes are intended to delineate the right of way assigned to bicyclists and motorists and to provide for more predictable movements by each. But a more important reason for constructing bike lanes is to better accommodate bicyclists through corridors where insufficient room exists for side-by-side sharing of existing streets by motorists and bicyclists. This can be accomplished by reducing the number of lanes, reducing lane width, or prohibiting or reconfiguring parking on given streets in order to delineate bike lanes. In addition, other things can be done on bike lane streets to improve the situation for bicyclists that might not be possible on all streets (e.g., improvements to the surface, augmented sweeping programs, special signal facilities, etc.). Generally, pavement markings alone will not measurably enhance bicycling.

If bicycle travel is to be provided by delineation, attention should be made to assure that high levels of service are provided with these lanes. It is important to meet bicyclist expectations and increase bicyclist perception of service quality, where capacity analysis demonstrates service quality measures are improved from the bicyclist's point of view.

Design guidance that addresses the mobility needs of bicyclists on Class II bikeways (bike lanes) is also distributed throughout this manual where appropriate.

- (4) *Class III Bikeway (Bike Route)*. Bike routes are shared facilities which serve either to:
- (a) Provide continuity to other bicycle facilities (usually Class II bikeways); or

- (b) Designate preferred routes through high demand corridors.

As with bike lanes, designation of bike routes should indicate to bicyclists that there are particular advantages to using these routes as compared with alternative routes. This means that responsible agencies have taken actions to assure that these routes are suitable as shared routes and will be maintained in a manner consistent with the needs of bicyclists. Normally, bike routes are shared with motor vehicles. The use of sidewalks as Class III bikeways is strongly discouraged.

It is emphasized that the designation of bikeways as Class I, II and III should not be construed as a hierarchy of bikeways; that one is better than the other. Each class of bikeway has its appropriate application.

In selecting the proper facility, an overriding concern is to assure that the proposed facility will not encourage or require bicyclists or motorists to operate in a manner that is inconsistent with the rules of the road.

An important consideration in selecting the type of facility is continuity. Alternating segments of Class I and Class II (or Class III) bikeways along a route are generally incompatible, as street crossings by bicyclists is required when the route changes character. Also, wrong-way bicycle travel will occur on the street beyond the ends of bike paths because of the inconvenience of having to cross the street.

Topic 1003 - Bikeway Design Criteria

1003.1 Class I Bikeways (Bike Paths)

Class I bikeways (bike paths) are facilities with exclusive right of way, with cross flows by vehicles minimized. Class I bikeways, unless adjacent to an adequate pedestrian facility, (see Index 1001.3(n)) are for the exclusive use of bicycles and pedestrians, therefore any facility serving pedestrians must meet accessibility requirements, see DIB 82. However, experience has shown that if regular pedestrian use is anticipated, separate facilities for pedestrians may be beneficial to minimize conflicts. Please note, sidewalks are not Class I bikeways because they are

primarily intended to serve pedestrians, generally cannot meet the design standards for Class I bikeways, and do not minimize vehicle cross flows. See Index 1003.3 for discussion of the issues associated with sidewalk bikeways.

Motor vehicles are prohibited from bike paths per the CVC. These prohibitions can be reinforced by signing.

(1) *Widths and Cross Slopes.* The minimum paved width of travel way for a two-way bike path shall be 8 feet, 10-foot preferred. The minimum paved width for a one-way bike path shall be 5 feet. It should be assumed that bicycle paths will be used for two-way travel. Development of a one-way bike path should be undertaken only in rare situations where there is a need for only one-direction of travel. Two-way use of paths designed for one-way travel increases the risk of head-on collisions, as it is difficult to enforce one-way operation. This is not meant to apply to two one-way paths that are parallel and adjacent to each other within a wide right of way. See Index 1003.1(15) Drainage, for cross slope information.

A minimum 2-foot wide shoulder, composed of the same pavement material as the path or all weather surface, free of vegetation, shall be provided adjacent to the traveled way of the path when not on a structure. See Figure 1003.1A. If all or part of the shoulder is paved with the same material as the path, it is to be delineated from the traveled way of the path with an edge line. A shoulder width of 3 feet should be provided where feasible. See Index 1003.1(15), Drainage, for cross slope information. A wider shoulder can reduce bicycle conflicts with pedestrians. Where the paved path width is wider than the minimum required, the unpaved shoulder area may be reduced proportionately.

If there is an adjacent pedestrian walkway, the edge of the traveled way of the bicycle path is to be separated from the pedestrian walkway by a minimum width of 5 feet of unpaved material. The 5-foot area of unpaved material may include landscaping or other features that provide a continuous obstacle to deter path and walkway users from using both paths as a single facility. These obstacles may be fences,

railings, solid walls, or dense shrubbery. Flexible delineators, poles, curbs, or pavement markers are not to be used because they will not deter users from using both paths as a single facility. These obstacles between the pedestrian walkways and bicycle paths are not to obstruct stopping sight distance in curves or corner sight distance at intersections with roadways or other paths.

Where heavy bicycle volumes are anticipated and/or significant pedestrian traffic is expected, the paved width of a two-way path should be greater than 10 feet, preferably 12 feet or more. Another important factor to consider in determining the appropriate width is that bicyclists will tend to ride side by side on bike paths, and bicyclists may need adequate passing clearance next to pedestrians and slower moving bicyclists.

Experience has shown that paved paths less than 12 feet wide can break up along the edge as a result of loads from maintenance vehicles.

See Figure 1003.1A for two-way Class I bikeway (bike path) width, cross slope, and side slope details.

(2) *Clearance to Obstructions.* A minimum 2-foot horizontal clearance from the paved edge of a bike path to obstructions shall be provided. See Figure 1003.1A. 3 feet should be provided. Adequate clearance from fixed objects is needed regardless of the paved width. If a path is paved contiguous with a continuous fixed object (e.g., fence, wall, and building), a 4-inch white edge line, 2 feet from the fixed object, is recommended to minimize the likelihood of a bicyclist hitting it. **The clear width of a bicycle path on structures between railings shall be not less than 10 feet.** It is desirable that the clear width of structures be equal to the minimum clear width of the path plus shoulders (i.e., 14 feet).

The vertical clearance to obstructions across the width of a bike path shall be a minimum of 8 feet and 7 feet over shoulder. Where practical, a vertical clearance of 10 feet is desirable.

(3) *Signing and Delineation.* For application and placement of signs, see the California MUTCD,

Section 9B. For pavement marking guidance, see the California MUTCD, Section 9C.

- (4) *Intersections with Highways.* Intersections are an important consideration in bike path design. Bicycle path intersection design should address both cross-traffic and turning movements. If alternate locations for a bike path are available, the one with the most beneficial intersection characteristics should be selected.

Where motor vehicle cross traffic and bicycle traffic is heavy, grade separations are desirable to eliminate intersection conflicts. Where grade separations are not feasible, assignment of right of way by traffic signals should be considered. Where traffic is not heavy, "STOP" or "YIELD" signs for either the path or the cross street (depending on volumes) may suffice.

Bicycle path intersections and their approaches should be on relatively flat grades. Stopping sight distances at intersections should be checked and adequate warning should be given to permit bicyclists to stop before reaching the intersection, especially on downgrades. When contemplating the placement of signs the designer is to discuss the proposed sign details with their Traffic Liaison so that conflicts may be minimized. Bicycle versus motor vehicle collisions may occur more often at intersections, where bicyclists misuse pedestrian crosswalks; thus, this should be avoided.

When crossing an arterial street, the crossing should either occur at the pedestrian crossing, where vehicles can be expected to stop, or at a location completely out of the influence of any intersection to permit adequate opportunity for bicyclists to see turning vehicles. When crossing at midblock locations, right of way should be assigned by devices such as "YIELD" signs, "STOP" signs, or traffic signals which can be activated by bicyclists. Even when crossing within or adjacent to the pedestrian crossing, "STOP" or "YIELD" signs for bicyclists should be placed to minimize potential for conflict resulting from turning autos. Where bike path "STOP" or "YIELD" signs are visible to approaching motor vehicle traffic, they should be shielded to avoid confusion. In some cases, Bike Xing signs may be placed in advance of the crossing to alert

motorists. Ramps should be installed in the curbs, to preserve the utility of the bike path. Ramps should be the same width as the bicycle paths. Curb cuts and ramps should provide a smooth transition between the bicycle paths and the roadway.

Assignment of rights of way is necessary where bicycle paths intersect roadways or other bicycle paths. See the California MUTCD, Section 9B.03 and Figure 9B-7 for guidance on signals and signs for rights of way assignment at bicycle path intersections.

- (5) *Paving at Crossings.* At unpaved roadway or driveway crossings, including bike paths or pedestrian walkways, the crossing roadway or driveway shall be paved a minimum of 15 feet to minimize or eliminate gravel intrusion on the path. The pavement structure at the crossing should be adequate to sustain the expected loading at that location

- (6) *Bike Paths Parallel and Adjacent to Streets and Highways.* A wide separation is recommended between bike paths and adjacent highways (see Figure 1003.1B). **The minimum separation between the edge of pavement of a one-way or a two-way bicycle path and the edge of travel way of a parallel road or street shall be 5 feet plus the standard shoulder width. Bike paths within the clear recovery zone of freeways shall include a physical barrier separation.** The separation is unpaved and does not include curbs or sidewalks. Separations less than 10 feet from the edge of the shoulder shall include landscaping or other features that provide a continuous obstacle to prevent bicyclists from encroaching onto the highway. Suitable obstacles may include fences or dense shrubs if speeds are less than 45 miles per hour. Low obstacles or intermittent obstacles (e.g., curbs, dikes, raised traffic bars, posts connected by cable or wire, flexible channelizers, etc.) shall not be used because bicyclists could fall over them into the roadway.

Bike paths immediately adjacent to streets and highways are not recommended. While they can provide separation between vehicles and non-motorized traffic, they typically introduce significant conflicts at intersections. In addition, they can create conflicts with

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HIGHWAY DESIGN MANUAL

Figure 1003.1A
Two-Way Class I Bikeway (Bike Path)

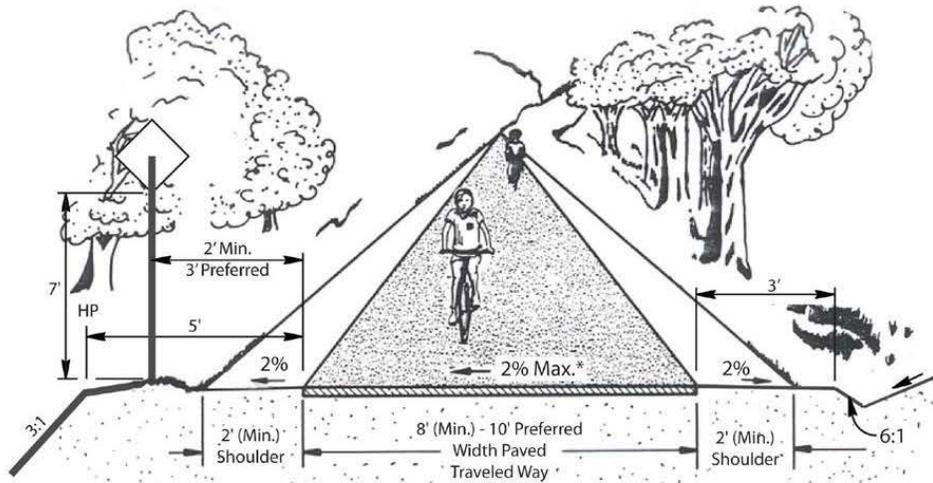
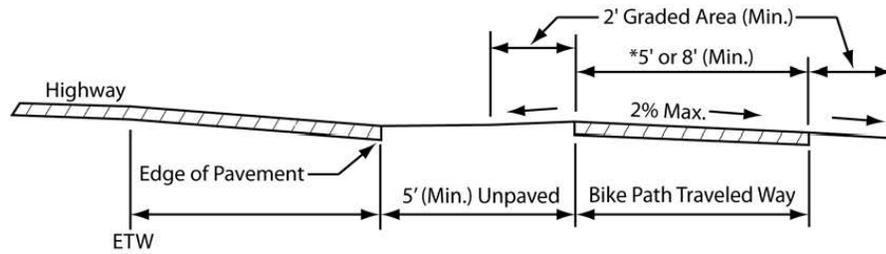


Figure Not To Scale

NOTES:

- (1) See Index 1003.1(13) for pavement structure guidance of bike path.
- (2) For sign clearances, see California MUTCD, Figure 9B-1.
- * 1% cross-slope minimum.

Figure 1003.1B
Typical Cross Section of Class I Bikeway (Bike Path) Parallel to Highway



NOTE:

(1) See Index 1003.1(6) for guidance on separation between bike paths and highways.

* One-Way: 5' Minimum Width

Two-Way: 8' Minimum Width

passengers at public transit facilities, and with vehicle occupants crossing the path. They are not a substitute for designing the road to meet bicyclist's mobility needs. Use of bicycle paths adjacent to roads is not mandatory in California, and many bicyclists will perceive these paths as offering a lower level of mobility compared with traveling on the road, particularly for utility trips. Careful consideration regarding how to address the above points needs to be weighed against the perceived benefits of providing a bike path adjacent to a street or highway. Factors such as urban density, the number of conflict points, the presence or absence of a sidewalk, speed and volume should be considered.

(7) *Bike Paths in the Median of Highway or Roadway.* Bike paths shall not be placed in the medians of State highways or roadways, especially freeways or expressways. Bike paths in the median of highways are not recommended because they require movements contrary to normal rules of the road. Specific problems with such facilities include:

- (a) Right-turns from the center of roadways for bicyclists are unnatural and unexpected by motorists.
- (b) Devoting separate phases to bicyclist movements to and from a median path at signalized intersections increases intersection delay.
- (c) Left-turning motorists must cross one direction of motor vehicle traffic and two directions of bicycle traffic, which increases conflicts.
- (d) Where intersections are infrequent, bicyclists will enter or exit bike paths at midblock.
- (e) Where medians are landscaped, visibility between bicyclists on the path and motorists at intersections may be diminished. See Chapter 900 for planting guidance.

(8) *Bicycle Path Design Speed.* The design speed of bicycle paths is established using the same principles as those applied to highway design speeds. The design speed given in Table 1003.1 shall be the minimum.

**Table 1003.1
Bike Path Design Speeds**

Type of Facility	Design Speed (mph) ⁽¹⁾
Bike Paths with Mopeds Prohibited	20
Bike Paths with Mopeds Permitted	30
Bike Paths on Long Downgrades (steeper than 4%, and longer than 500')	30

NOTE:

(1) On bike paths with mopeds prohibited, a lower design speed can be used for the crest vertical curve, equivalent to 1 mile per hour per percent grade for grades exceeding a vertical rise of 10 feet, when at a crest in path.

Installation of "speed bumps", gates, obstacles, posts, fences or other similar features intended to cause bicyclists to slow down are not to be used.

(9) *Horizontal Alignment and Superelevation.* The minimum radius of curvature negotiable by a bicycle is a function of the superelevation of the bicycle path surface, the coefficient of friction between the bicycle tires and the bicycle path surface, and the speed of the bicycle.

For all bicycle path applications the maximum superelevation rate is 2 percent.

The minimum radius of curvature should be 160 feet for 25 mile per hour and 260 feet for 30 miles per hour. When curve radii smaller than those given because of right of way, topographical or other considerations, standard curve warning signs and supplemental pavement markings should be installed. The negative effects of nonstandard curves can also be partially offset by widening the pavement through the curves.

(10) *Stopping Sight Distance.* To provide bicyclists with an opportunity to see and react to the unexpected, a bicycle path should be designed

with adequate stopping sight distances. The minimum stopping sight distance based on design speed shall be 125 feet for 20 miles per hour, 175 feet for 25 miles per hour and 230 feet for 30 miles per hour. The distance required to bring a bicycle to a full controlled stop is a function of the bicyclist's perception and brake reaction time, the initial speed of the bicycle, the coefficient of friction between the tires and the pavement, and the braking ability of the bicycle.

Stopping sight distance is measured from a bicyclist's eyes, which are assumed to be 4 ½ feet above the pavement surface to an object ½-foot high on the pavement surface.

(11) *Length of Crest Vertical Curves.* Figure 1003.1C indicates the minimum lengths of crest vertical curves for varying design speeds.

(12) *Lateral Clearance on Horizontal Curves.* Figure 1003.1D indicates the minimum clearances to line of sight obstructions, *m*, for horizontal curves. It is assumed that the bicyclist's eyes are 4 ½ feet above the pavement surface to an object ½-foot high on the pavement surface.

Bicyclists frequently ride abreast of each other on bicycle paths, and on narrow bicycle paths, bicyclists have a tendency to ride near the middle of the path. For these reasons, lateral clearances on horizontal curves should be calculated based on the sum of the stopping sight distances for bicyclists traveling in opposite directions around the curve. Where this is not possible or feasible, the following or combination thereof should be provided: (a) the path through the curve should be widened to a minimum paved width of 14 feet; and (b) a yellow center line curve warning sign and advisory speed limit signs should be installed.

(13) *Grades.* Bike path grades must meet DIB 82. The maximum grade rate recommended for bike paths should be 5 percent. Sustained grades should be limited to 2 percent.

(14) *Pavement Structure.* The pavement material and structure of a bike path should be designed in the same manner as a highway, with a recommendation from the District Materials Branch. It is important to construct and

maintain a smooth, well drained, all-weather riding surface with skid resistant qualities, free of vegetation growth. Principal loads will normally be from maintenance and emergency vehicles.

(15) *Drainage.* For proper drainage, the surface of a bike path should have a minimum cross slope of 1 percent to reduce ponding and maximum of 2 percent Per DIB 82. Sloping of the traveled way in one direction usually simplifies longitudinal drainage design and surface construction, and accordingly is the preferred practice. However, the unpaved shoulders slope away from the path at 2 percent. Ordinarily, surface drainage from the path will be adequately dissipated as it flows down the gently sloping shoulder. However, when a bike path is constructed on the side of a hill, a drainage ditch of suitable dimensions may be necessary on the uphill side to intercept the hillside drainage. Where necessary, catch basins with drains should be provided to carry intercepted water across the path. Such ditches should be designed in such a way that no undue obstacle is presented to bicyclists.

Culverts or bridges are necessary where a bike path crosses a drainage channel.

(16) *Entry Control for Bicycle Paths.* Obstacle posts and gates are fixed objects and placement within the bicycle path traveled way can cause them to be an obstruction to bicyclists. Obstacles such as posts or gates may be considered only when other measures have failed to stop unauthorized motor vehicle entry. Also, these obstacles may be considered only where safety and other issues posed by actual unauthorized vehicle entry are more serious than the safety and access issues posed to bicyclists, pedestrians and other authorized path users by the obstacles.

The 3-step approach to prevent unauthorized vehicle entry is:

- (a) Post signs identifying the entry as a bicycle path with regulatory signs prohibiting motor vehicle entry where roads and bicycle paths cross and at other path entry points.
- (b) Design the path entry so it does not look like a vehicle access and makes intentional

access by unauthorized users more difficult. Dividing a path into two one-way paths prior to the intersection, separated by low plantings or other features not conducive to motor vehicle use, can discourage motorist from entering and reduce driver error.

- (c) Assess whether signing and path entry design prevents or minimizes unauthorized entry to tolerable levels. If there are documented issues caused by unauthorized motor vehicle entry, and other methods have proven ineffective, assess whether the issues posed by unauthorized vehicle entry exceed the crash risks and access issues posed by obstacles.

If the decision is made to add bollards, plantings or similar obstacles, they should be:

- Yielding to minimize injury to bicyclists and pedestrians who may strike them.
- Removable or moveable (such as gates) for emergency and maintenance access must leave a flush surface when removed.
- Reflectorized for nighttime visibility and painted, coated, or manufactured of material in a bright color to enhanced daytime visibility.
- Illuminated when necessary.
- Spaced to leave a minimum of 5 feet of clearance of paved area between obstacles (measured from face of obstacle to face of adjacent obstacle). Symmetrically about the center line of the path.
- Positioned so an even number of bicycle travel lanes are created, with a minimum of two paths. Odd number of openings increases the risk of head-on collisions if traffic in both directions tries to use the same opening.
- Placed so additional, non-centerline/lane line posts are located a minimum of 2 feet from the edge of pavement.
- Delineated as shown in California MUTCD Figure 9C-2.

- Provide special advance warning signs or painted pavement markings if sight distance is limited.
- Placed 10 to 30 feet back from an intersection, and 5 to 10 feet from a bridge, so bicyclists approach the obstacle straight-on and maintenance vehicles can pull off the road.
- Placed beyond the clear zone on the crossing highway, otherwise breakaway.

When physical obstacles are needed to control unauthorized vehicle access, a single non-removable, flexible, post on the path centerline with a separate gate for emergency/maintenance vehicle access next to the path, is preferred. The gate should swinging away from the path,

Fold-down obstacle posts or bollards shall not be used within the paved area of bicycle paths. They are often left in the folded down position, which presents a crash hazard to bicyclists and pedestrians. When vehicles drive across fold-down obstacles, they can be broken from their hinges, leaving twisted and jagged obstructions that project a few inches from the path surface.

Obstacle posts or gates must not be used to force bicyclists to slow down, stop or dismount. Treatments used to reduce vehicle speeds may be used where it is desirable to reduce bicycle speeds.

For obstacle post visibility marking, and pavement markings, see the California MUTCD, Section 9C.101(CA).

- (17) *Lighting.* Fixed-source lighting raises awareness of conflicts along paths and at intersections. In addition, lighting allows the bicyclist to see the bicycle path direction, surface conditions, and obstacles. Lighting for bicycle paths is important and should be considered where nighttime use is not prohibited, in sag curves (see Index 201.5), at intersections, at locations where nighttime security could be a problem, and where obstacles deter unauthorized vehicle entry to bicycle paths. See Index 1003.1(16). Daytime lighting should also be considered through underpasses or tunnels.

Figure 1003.1C

**Minimum Length of Bicycle Path Crest Vertical Curve (L)
Based on Stopping Sight Distance (S)**

$$L = 2S - \frac{1600}{A} \quad \text{when } S > L$$

$$L = \frac{AS^2}{1600} \quad \text{when } S < L$$

Double line represents S = L

L = Minimum length of vertical curve – feet

A = Algebraic grade difference - %

S = Stopping sight distance – feet

Refer to Figure 1003.1D to determine “S”, for a given design speed “V”

Height of cyclist eye = 4½ feet

Height of object = ½-foot

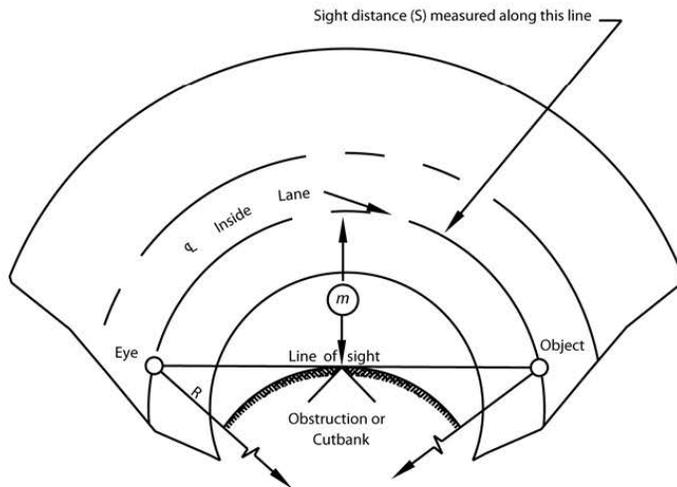
A (%)	S = Stopping Sight Distance (ft)												
	70	90	110	125	130	150	170	175	190	210	230	250	270
3													7
4										20	60	100	140
5							20	30	60	100	140	180	220
6		S > L				33	73	83	113	153	193	233	270
7				21	31	71	111	121	151	191	231	273	319
8			20	50	60	100	140	150	180	221	265	313	365
9		2	42	72	82	122	162	172	203	248	298	352	410
10		20	60	90	100	140	181	191	226	276	331	391	456
11		35	75	105	115	155	199	211	248	303	364	430	501
12	7	47	87	117	127	169	217	230	271	331	397	469	547
13	17	57	97	127	137	183	235	249	293	358	430	508	592
14	26	66	106	137	148	197	253	268	316	386	463	547	638
15	33	73	113	146	158	211	271	287	338	413	496	586	683
16	40	80	121	156	169	225	289	306	361	441	529	625	729
17	46	86	129	166	180	239	307	325	384	469	562	664	775

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Figure 1003.1D

Minimum Lateral Clearance (m) on Bicycle Path Horizontal Curves



S = Sight distance in feet.
R = Radius of ℓ of lane in feet.
m = Distance from ℓ of lane in feet.
See Figure 1003.1D to determine "S" for a given design speed "V".

Angle is expressed in degrees

$$m = R \left[1 - \cos \left(\frac{28.65S}{R} \right) \right]$$

$$S = \frac{R}{28.655} \left[\cos^{-1} \left(\frac{R-m}{R} \right) \right]$$

Formula applies only when S is equal to or less than length of curve.

Line of sight is 28° above ℓ inside lane at point of obstruction.

Height of bicyclist's eye is 4 1/2 feet.

R (ft)	S = Stopping Sight Distance (ft)										
	60	80	100	120	140	160	180	200	220	240	260
25	15.9										
50	8.7	15.2	23.0	31.9	41.5						
75	5.9	10.4	16.1	22.8	30.4	38.8	47.8	57.4	67.2		
95	4.7	8.3	12.9	18.3	24.7	31.8	39.5	48.0	56.9	66.3	75.9
125		6.3	9.9	14.1	19.1	24.7	31.0	37.9	45.4	53.3	1.76
155		5.1	8.0	11.5	15.5	20.2	25.4	31.2	37.4	44.2	51.4
175		4.6	7.1	10.2	13.8	18.0	22.6	27.8	33.5	39.6	46.1
200		4.0	6.2	8.9	12.1	15.8	19.9	24.5	29.5	34.9	40.8
225			5.5	8.0	10.8	14.1	17.8	21.9	26.4	31.3	36.5
250			5.0	7.2	9.7	12.7	16.0	19.7	23.8	28.3	33.1
275			4.5	6.5	8.9	11.6	14.6	18.0	21.7	25.8	30.2
300			4.2	6.0	8.1	10.6	13.4	16.5	19.9	23.7	27.7
350				5.1	7.0	9.1	11.5	14.2	17.1	20.4	23.9
390				4.6	6.3	8.2	10.3	12.8	15.4	18.3	21.5
500					4.9	6.4	8.1	10.0	12.1	14.3	16.8
565					4.3	5.7	7.2	8.8	10.7	12.7	14.9
600					4.1	5.3	6.7	8.3	10.1	12.0	14.0
700						4.6	5.8	7.1	8.6	10.3	12.0
800						4.0	5.1	6.2	7.6	9.0	10.5
900							4.5	5.6	6.7	8.0	9.4
1000							4.0	5.0	6.0	7.2	8.4

Depending on the location, average maintained horizontal illumination levels of 5 lux to 22 lux should be considered. Where special security problems exist, higher illumination levels may be considered. Light standards (poles) should meet the recommended horizontal and vertical clearances. Luminaires and standards should be at a scale appropriate for a pedestrian or bicycle path. For additional guidance on lighting, consult with the District Traffic Electrical Unit.

1003.2 Class II Bikeways (Bike Lanes)

Design guidance that address the safety and mobility needs of bicyclists on Class II bikeways (bike lanes) is distributed throughout this manual where appropriate.

For Class II bikeway signing and lane markings, see the California MUTCD, Section 9C.04.

1003.3 Class III Bikeways (Bike Routes)

Class III bikeways (bike routes) are intended to provide continuity to the bikeway system. Bike routes are established along through routes not served by Class I or II bikeways, or to connect discontinuous segments of bikeway (normally bike lanes). Class III facilities are facilities shared with motor vehicles on the street, which are established by placing bike route signs along roadways. Additional enhancement of Class III facilities can be provided by adding shared roadway markings along the route. For application and placement of signs and pavement markings, see the California MUTCD Section 9C.

Minimum widths for Class III bikeways are represented, in the minimum standards for highway lanes and shoulder.

Since bicyclists are permitted on all highways (except prohibited freeways), the decision to designate the route as a bikeway should be based on the advisability of encouraging bicycle travel on the route and other factors listed below.

(1) *On-street Bike Route Criteria.* To be of benefit to bicyclists, bike routes should offer a higher degree of service than alternative streets. Routes should be signed only if some of the following apply:

- (a) They provide for through and direct travel in bicycle-demand corridors.
- (b) Connect discontinuous segments of bike lanes.
- (c) They provide traffic actuated signals for bicycles and appropriate assignment of right of way at intersections to give greater priority to bicyclists, as compared with alternative streets.
- (d) Street parking has been removed or restricted in areas of critical width to provide improved safety.
- (e) Surface imperfections or irregularities have been corrected (e.g., utility covers adjusted to grade, potholes filled, etc.).
- (f) Maintenance of the route will be at a higher standard than that of other comparable streets (e.g., more frequent street sweeping).

(2) *Sidewalk as Bikeway.* Sidewalks are not to be designated for bicycle travel. Wide sidewalks that do not meet design standards for bicycle paths or bicycle routes also may not meet the safety and mobility needs of bicyclists. Wide sidewalks can encourage higher speed bicycle use and can increase the potential for conflicts with turning traffic at intersections as well as with pedestrians and fixed objects.

In residential areas, sidewalk riding by young children too inexperienced to ride in the street is common. It is inappropriate to sign these facilities as bikeways because it may lead bicyclists to think it is designed to meet their safety and mobility needs. Bicyclists should not be encouraged (through signing) to ride their bicycles on facilities that are not designed to accommodate bicycle travel.

(3) *Shared Transit and Bikeways.* Transit lanes and bicycles are generally not compatible, and present risks to bicyclists. Therefore sharing exclusive use transit lanes for buses with bicycles is discouraged.

Bus and bicycle lane sharing should be considered only under special circumstances to provide bikeway continuity, such as:

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- (a) If bus operating speed is 25 miles per hour or below.
- (b) If the grade of the facility is 5 percent or less.

1003.4 Trails

Trails are generally, unpaved multipurpose facilities suitable for recreational use by hikers, pedestrians, equestrians, and off-road bicyclists. While many Class I facilities are named as trails (e.g. Iron Horse Regional Trail, San Gabriel River Trail), trails as defined here do not meet Class I bikeway standards and should not be signed as bicycle paths. Where equestrians are expected, a separate equestrian trail should be provided. See DIB 82 for trail requirements for ADA. See Index 208.7 for equestrian undercrossing guidance.

- Pavement requirements for bicycle travel are not suitable for horses. Horses require softer surfaces to avoid leg injuries.
- Bicyclists may not be aware of the need to go slow or of the separation need when approaching or passing a horse. Horses reacting to perceived danger from predators may behave unpredictably; thus, if a bicyclist appears suddenly within their visual field, especially from behind they may bolt. To help horses not be surprised by a bicyclist, good visibility should be provided at all points on equestrian paths.
- When a corridor includes equestrian paths and Class I bikeways, the widest possible lateral separation should be provided between the two. A physical obstacle, such as an open rail fence, adjacent to the equestrian trail may be beneficial to induce horses to shy away from the bikeway, as long as the obstacle does not block visibility between the equestrian trail and bicycle path.

See FHWA-EP-01-027, Designing Sidewalks and Trails for Access and DIB 82 for additional design guidance.

1003.5 Miscellaneous Criteria

The following are miscellaneous bicycle treatment criteria. Specific application to Class I, and III bikeways are noted. Criteria that are not noted as applying only to bikeways apply to any highway,

roadways and shoulders, except freeways where bicycles are prohibited), without regard to whether or not bikeways are established.

Bicycle Paths on Bridges – See Topic 208.

- (1) *Pavement Surface Quality.* The surface to be used by bicyclists should be smooth, free of potholes, and with uniform pavement edges.
- (2) *Drainage Grates, Manhole Covers, and Driveways.* Drainage inlet grates, manhole covers, etc., should be located out of the travel path of bicyclists whenever possible. When such items are in an area that may be used for bicycle travel, they shall be designed and installed in a manner that meets bicycle surface requirements. See Standard Plans. They shall be maintained flush with the surface when resurfacing.

If grate inlets are to be located in roadway or shoulder areas (except freeways where bicycles are prohibited) the inlet design guidance of Index 837.2(2) applies.

Future driveway construction should avoid construction of a vertical lip from the driveway to the gutter, as the lip may create a problem for bicyclists when entering from the edge of the roadway at a flat angle. If a lip is deemed necessary, the height should be limited to ½ inch.

- (3) *At-grade Railroad Crossings and Cattle Guards.* Whenever it is necessary for a Class I bikeway, highway or roadway to cross railroad tracks, special care must be taken to ensure that the safety of users is protected. The crossing must be at least as wide as the traveled way of the facility. Wherever possible, the crossing should be straight and at right angles to the rails. For bikeways or highways that cross tracks and where a skew is unavoidable, the shoulder or bikeway should be widened, to permit bicyclists to cross at right angles (see Figure 1003.5). If this is not possible, special construction and materials should be considered to keep the flangeway depth and width to a minimum.

Pavement should be maintained so ridge buildup does not occur next to the rails. In

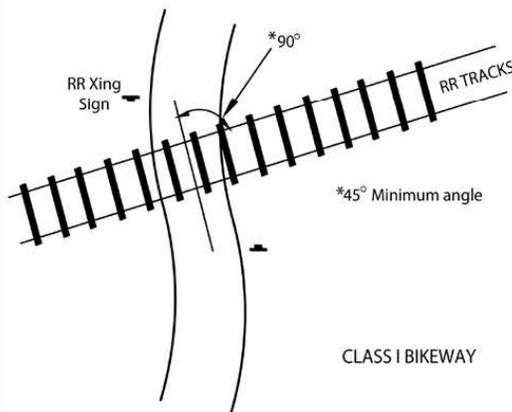
some cases, timber plank crossings can be justified and can provide for a smoother crossing.

All railroad crossings are regulated by the California Public Utilities Commission (CPUC). All new bicycle path railroad crossings must be approved by the CPUC. Necessary railroad protection will be determined based on a joint field review involving the applicant, the railroad company, and the CPUC.

Cattle guards across any roadway are to be clearly marked with adequate advance warning. Cattle guards are only to be used where there is no other alternative to manage livestock.

The California MUTCD has specific guidance on Rail and Light Rail crossings. See Part 8 of the California MUTCD.

Figure 1003.5
Railroad Crossing
Class I Bikeway



NOTE:

See Index 403.3 Angle of Intersection for Class II and Class III facilities.

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APPENDIX C

CEQA INITIAL STUDY CHECKLIST HIGH DESERT CORRIDOR – NEW STATE ROUTE 138 BIKE PATH COMPONENT

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CEQA ENVIRONMENTAL CHECKLIST

CEQA Environmental Checklist

07-LA-138; 08-SB-18

New SR-138 (E-220)

16720

Dist.-Co.-Rte.

P.M/P.M.

E.A.

This checklist identifies physical, biological, social, and economic factors that might be affected by the proposed High Desert Multipurpose Corridor (HDC) *Bike Path* project. In many cases, background studies performed in connection with the projects indicate no impacts. A NO IMPACT answer in the last column reflects this determination. Where there is a need for clarifying discussion, the discussion is included either following the applicable section of the checklist or is within the body of the environmental document itself. The words "significant" and "significance" used throughout the following checklist are related to CEQA, not NEPA, impacts. The questions in this form are intended to encourage the thoughtful assessment of impacts and do not represent thresholds of significance.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
I. AESTHETICS: Would the project:				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

a. **Less Than Significant with Mitigation.** For the purpose of this analysis, it is assumed the *Bike Path* would be located within future publicly-owned right-of-way (ROW) and would accompany a new freeway within the corridor; hence visual impacts are assessed in the context of the *Bike Path* being adjacent to a new six-lane highway facility. The proposed project is situated in a rural, high desert, sparsely populated environment characterized by expansive open space. Vacant parcels typically contain mostly low-lying saltbush scrub and creosote bush scrub habitats, with interspersed Joshua trees. Characteristic of the Mojave Desert, the topography of the terrain is relatively flat, with the exception of a few isolated hills, locally termed 'buttes.' On clear days, distant southerly views from the site are enhanced by the San Bernardino and San Gabriel mountain ranges.

Because the freeway and any future railroad would both be elevated on fill above the natural terrain, consideration should be given to aligning the proposed *Bike Path* on the south side of the freeway to allow cyclists and other path users unobstructed views of the mountains. Motorists traveling on SR-138 would also have an unobstructed view of the surrounding desert and of the mountains on clear days. The proposed corridor alignment would avoid the aforementioned hills and there are no nearby historic buildings. In this regard, views from surrounding areas toward the new facility would be dominated by the freeway, both due to its relatively large width and elevation (approximately 12 ft. above existing grade). *Bike Path* construction may require removal of some Joshua trees; however, because the trees tend not to occur in clusters within the project corridor, tree removals could be minimized during design by making slight adjustments to the path alignment.

b. **No Impact.** The existing SR-18 / SR-38 corridor is not designated as a state scenic highway.

c. **Less Than Significant Impact with Mitigation.** Since the proposed highway alignment traverses open land, there are no locally-designated scenic routes within the project limits. The existing overall visual quality of the project site can be characterized as ranging from average to high. However, as described in Item I.a above, the viewshed quality must be considered within the context of the proposed future development within the corridor. The future visual environment would substantially decline, as it would be dominated by the new highway facility combined with a potential future center median railroad. Because the freeway would be elevated above existing terrain, the *Bike Path* would not even be visible from flat desert viewpoints on the opposite (presumably south) side of the freeway. The 10-ft.-wide path would clearly be a visible intrusion into a mostly undisturbed desert environment; however, unlike the freeway the accompanying *Bike Path* would not interrupt the viewshed with a massive elevated

structure. Existing expansive views of open desert terrain would be obstructed by the future freeway. In this context, the direct impact of the *Bike Path* would not be considered significant, although there could potentially be cumulatively significant impacts.

The proposed project would include landscaping within public ROW, consistent with the Caltrans' existing procedures and standards regarding plant materials and placement. Affected local jurisdictions would be invited to work with Caltrans on the landscaping plans associated with construction of the *Bike Path*.

Caltrans existing program to collect litter, replace landscaping, and clean graffiti within their ROW would be applied during operation of the new *Bike Path*; therefore, the proposed project would not result in substantial adverse aesthetic impacts related to litter, degraded landscaping, and graffiti.

d. **Less Than Significant Impact with Mitigation.** The existing project area is mostly undeveloped and isolated from urbanization, highways, and other major sources of light and glare. Future freeway and potentially rail development within the proposed project corridor would introduce new sources of light and glare, whether or not the *Bike Path* is built. Because the project site predominantly consists of undeveloped open space, few sensitive land uses would be adversely affected by light or glare associated with the proposed project. The proposed project would be constructed in accordance with Caltrans and local government design standards and specifications that restrict future lighting to the minimum level necessary to safely illuminate outdoor areas, and ensure that light fixtures are placed in such a manner that directs light downward to minimize light spillage and incidental glare.

II. AGRICULTURE AND FOREST RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

a. **Potentially Significant Impact.** Prime farmland has the best combination of physical and chemical characteristics for producing agricultural crops and may include land currently used as cropland, pastureland, rangeland, or forestland. Farmland of statewide or local importance is land that does not qualify as prime or unique farmland but that is currently irrigated, is pastureland, or produces non-irrigated crops; its importance is determined by the state or local government. Based on a review of the Farmland Mapping and Monitoring Program of the California Department of Conservation, the proposed *Bike Path* would traverse prime farmland located east of Big Rock Wash and in the vicinity of Gray Butte Field. Prime farmland also exists at two locations on the north side of East Avenue P-8: one to the east of 40th Street East; and one to the east of 50th Street East. West of Krey Field, there is mapped land (i.e., Meadowbrook Dairy) identified as Farmland of Statewide Importance (DOC, 2010). These impacts should be further assessed to determine significance and develop mitigation, if appropriate. Route options to the proposed HDC alignment have been developed with the intent of minimizing direct loss of some lands in agricultural production.

b. **Less Than Significant Impact with Mitigation.** The vast majority of the land located within the proposed *Bike Path* corridor is not used for agricultural purposes. Still, the proposed project would cross at least three properties that are being actively farmed, and there could be Williamson Act contracts attached to the affected land parcels. Assessor's data typically show that designated

agricultural land located outside of a city's planning area is usually under Williamson Act contract. These impacts should be further assessed to determine significance and develop appropriate mitigation.

c-d. **No Impact.** The proposed new SR-138 corridor is located entirely within the Mojave desert. No forest land, timberland, or timberland-zoned Timberland Production areas are located within the proposed project vicinity.

e. **Less Than Significant Impact.** Farmlands potentially affected by the proposed *Bike Path* are located in rural areas outside of any city's sphere of influence, and are not expected to be subject to development pressures in the foreseeable future, even with a new freeway. No land used for forestry purposes would be affected by the proposed project.

III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a. **No impact.** To conform to state and federal air quality plans, a project must be included in approved transportation plans and programs. The HDC project is included in the Southern California Association of Government's (SCAG's) 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), which was adopted by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) in April 2012 after a transportation and air quality conformity determination had been issued. The project is also in SCAG's 2013 Federal Transportation Improvement Program, which was federally approved on December 14, 2012; therefore, the proposed project would be in conformance with the Clean Air Act. Moreover, the *Bike Path* component of the project would remove some vehicles from the highway, which is an objective of both the regional and federal plans.

b. **Less than Significant Impact.** Short-term air quality impacts are expected during construction due to motor vehicle and construction equipment emissions. With the application of various required controls to be incorporated into the proposed project, these temporary air quality impacts are considered less than significant.

When operational, the *Bike Path* is intended to encourage people to use non-motorized forms of transportation. It is anticipated that the proposed project would result in a very slight decrease in the amount of some criteria pollutants when compared to the No Project Alternative; therefore, the proposed *Bike Path* should result in an overall beneficial effect, albeit small, on air pollutant emissions.

c. **Less than Significant Impact** See response to Item III.a. The project site is located in the Mojave Desert Air Basin. Air quality regulations within the Project area are implemented through the Mojave Desert Air Quality Management District (AQMD) and Antelope Valley AQMD. These basins are designated as nonattainment for ozone (O₃), particulate matter of 2.5 microns or smaller in diameter (PM_{2.5}), and particulate matter of ten microns or smaller in diameter (PM₁₀). During construction the *Bike Path* component of the proposed project would be expected to result in only minor, temporary changes to area emissions of O₃ precursors and particulate matter. From an operational perspective, the *Bike Path* would effectively remove a miniscule number of cars from the road with respect to freeway traffic volumes. Therefore, operation of the proposed project would have no cumulative effect on the applicable air quality plans due to improved traffic circulation in the area. Given these considerations, project contributions to cumulative air quality impacts would not be considered cumulatively considerable.

d. **Less than Significant Impact.** During construction, adjacent areas would be exposed to pollutants from grading and construction equipment. However, the area adjacent to the project corridor is predominantly vacant land, with very little development. The corridor does traverse land in the vicinity of Littlerock High School and Lake Los Angeles School. With the application of various required emission control measures to be incorporated into the proposed project, these temporary air quality impacts are considered less than significant. Once operational, the proposed *Bike Path* would not affect sensitive receptors as the non-motorized traffic it would support does not generate air emissions.

e. **No Impact.** While there may be a short-term increase in intermittent diesel fume odors during construction, these odors would be temporary and should dissipate rapidly. The corridor traverses a sparsely populated region. Because it would be open to only non-motorized users, operation of the *Bike Path* would not result in impacts related to the creation of odors. No mitigation is required.

IV. BIOLOGICAL RESOURCES: Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

a. **Potentially Significant Impact.** The area within the project ROW could potentially support unique, threatened, or endangered species of plants, animals, and their critical habitats. While several special status plant species have been recorded in the proposed project region, most have a low to moderate potential to occur at the site. Of these species, some have been recorded at Edwards Air Force Base, where they are associated with the margins of dry lake beds with different conditions from those in the project area. Joshua tree and yucca species, locally sensitive species protected under local ordinances and the California Desert Native Plants Act, are found within Mojave creosote bush scrub, Mojave mixed woody scrub, Joshua tree woodland, and partially stabilized desert sand field communities. Special status wildlife species potentially occurring in or around the project area include: Mojave ground squirrel (*Spermophilus mohavensis*); desert tortoise (*Gopherus agassizi*); resident birds such as the loggerhead shrike (*Lanius ludovicianus*); nesting raptors such as the red-tailed hawk (*Buteo jamaicensis*), burrowing owl (*Athene cunicularia*), and Swainson's hawk (*Buteo swainsoni*); wintering birds such as the mountain plover (*Charadrius montanus*); reptiles such as the silvery legless lizard (*Anniella pulchra*) and Mojave fringe-toed lizard (*Uma scoparia*); and special status bats. (Sanitation Districts of Los Angeles County, 2005) Given these considerations, potentially significant impacts due to *Bike Path* construction and operation may occur.

b. **Potentially Significant Impact.** The proposed *Bike Path* project would cross several desert washes, including Big Rock Wash and its smaller branches. The proposed project could affect riparian habitat associated with the larger drainages, including Big Rock Wash and Little Rock Wash. It is expected that riparian habitat impacts could be reduced through careful route selection to avoid as many trees as possible, and by minimizing construction activity within the wash channels. Joshua tree woodland is considered a sensitive natural community and highest inventory priority by the California Department of Fish and Wildlife due to its scarcity and decline throughout its range and because of numerous listed plant and wildlife species that inhabit this community. *Bike Path* construction may require removal/relocation of some Joshua trees; however, these removals could be minimized during design by making slight adjustments to the path alignment. The U.S. Fish and Wildlife Service designated critical habitat for the desert tortoise on February 8, 1994. The project corridor in San Bernardino County is located about six to eight miles south of the Fremont Kramer Desert Wildlife Management Area within the Western Mojave Recovery Unit, an area essential to the survival and recovery of the desert tortoise. (USFWS, 2011) Field protocol surveys and development of appropriate mitigation to avoid impacts to the tortoise would be required.

c. **Less than Significant with Mitigation.** A comprehensive wetland assessment for the proposed project corridor will be conducted; however, it is expected that any wetlands found in this desert environment would be limited to major desert washes, such as Big Rock Wash and Little Rock Wash. In past studies the U.S. Army Corps of Engineers has indicated that the isolated washes in the Antelope Valley are not considered 'Waters of the United States,' as defined in the Clean Water Act. However, ephemeral washes are considered 'Waters of the State' subject to state conservation regulations. Should Waters of the State be located within the project corridor, they would be delineated and described in a wetland delineation report to be prepared by a qualified biologist.

d. **Less than Significant with Mitigation.** The proposed HDC project would involve establishment of fenced ROW to enclose freeway and potential railroad improvements. This new above-grade facility would create a major north-south obstruction to wildlife movement. With input from project biologists, this issue would be addressed through project design to allow animal passage at identified wildlife crossing areas. In certain locations, larger culvert sizes would be necessary in order to provide access for large animals. The *Bike Path* itself would not be a hindrance to animals that wish to cross north-to-south. As such, the proposed *Bike Path* project itself would not substantially interfere with any migratory wildlife corridor or wildlife nursery site. However, this issue should be further assessed to determine whether cumulative impacts would occur.

e. **Less than Significant with Mitigation.** The West Mojave Plan establishes a regional strategy for conserving plant and animal species and their habitats and defines a process for complying with threatened and endangered species. However, this plan by the U.S. Bureau of Land Management was not adopted by state or local agencies and therefore only applies to 3.2 million acres of federal lands. The proposed project corridor in Los Angeles County traverses lands that are currently proposed for designation as the Antelope Valley Significant Ecological Area (SEA). As a component of the Los Angeles County Conservation/Open Space Element, the SEA Program is a resource identification tool that indicates the existence of important biological resources. SEAs are not preserves, but are areas where the county deems it important to facilitate a balance between limited development and resource conservation. Limited development activities are reviewed closely in these areas where site design is a key element in conserving fragile resources such as streams, oak woodlands and threatened or endangered species and their habitat. (County of Los Angeles, 2009) Removal of Joshua trees and other specified native tree and cactus species triggers a county permit issued under the California Desert Native Plants Act. Joshua trees also receive protection under the Palmdale Native Desert Vegetation Ordinance. The proposed project will be designed to comply with all local ordinances and permits for the protection of biological resources. Further review of these and other local government policies and ordinances for the protection of biological resources is necessary to determine if the proposed *Bike Path* component of the HDC would result in any conflicts.

f. **Less Than Significant Impact.** See response to IV.e above. There are no existing habitat conservation plans or natural community conservation plans applicable to this area.

V. CULTURAL RESOURCES: Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

a. **Potentially Significant Impact.** European exploration of the western Mojave Desert dates back to 1775 when Captain Juan Batista de Anza explored the region. In later years the Spanish established missions and conducted forays into the western Mojave desert to control the Native Americans. During the Mexican Period, the government established rancheros for cattle ranching and the De Anza trail was reopened to accommodate tremendous traffic after 1840. In the American Period (after 1848), gold, silver and borax mining led to increased settlement of the western Mojave region, including the nearby mountains. (Sanitation Districts of Los Angeles County, 2005) According to the City of Palmdale General Plan (1993), Environmental Resource Element (Exhibit ER-6), there are no identified historic structures located within the City where the proposed *Bike Path* corridor is located. Given the rich history of the High Desert region, there is a potential that the proposed *Bike Path* project could result in adverse impacts to historic resources; hence, further evaluation is required.

b. **Potentially Significant Impact.** The High Desert region has a long history of human habitation. Native American tribes lived throughout the region, using the study area for hunting and gathering and as travel routes. Precise archaeological information for this area is very limited due to its relative isolation and lack of prior development proposals. (City of Adelanto. 1994) According to the City of Palmdale General Plan (1993), Environmental Resource Element (Exhibit ER-7), the proposed *Bike Path* corridor traverses an area identified with a 'Moderately High' sensitivity level for archaeological resources. Given these considerations, there is a potential that the proposed *Bike Path* project could result in adverse impacts to archaeological resources; hence, further evaluation is required. If subsurface cultural resources are discovered during earth-moving activities, it is Caltrans' policy to discontinue work in the area of the find until a qualified archaeologist can evaluate the discovery. Mitigation of the discovered cultural resources must be conducted in accordance with the requirements outlined in the CEQA Guidelines, Section 15126.4(b), 'Mitigation Measures Related to Impacts on Historic Resources'.

c. **Potentially Significant Impact.** According to the City of Palmdale General Plan (1993), Environmental Resource Element (Exhibit ER-8) the potential for paleontological resources within the western end of the *Bike Path* corridor is considered to be 'Undetermined.' However, record searches for a more recent study of the Palmdale region found fossils of thirty-eight different species previously recovered from fourteen different localities in Pleistocene or Quaternary older alluvium, Harold Formation, Anaverde Formation, and Punchbowl Formation sediments. These fossil localities yielded lizards, snakes, birds, rabbits, skunks,

gophers, rats, mice, mammoth, mastodon, camels, horse, oak, pine, cottonwood, avocado, squaw apple, willow, and sycamore. This study identifies the east Palmdale region as having low-to-high sensitivity range for encountering fossils. (CEC, 2008) Further evaluation is therefore necessary because there is a potential that the proposed *Bike Path* project could result in adverse impacts to paleontological resources.

d. **Less Than Significant Impact with Mitigation.** There are no known human burial grounds within the project location, nor is there past evidence of use as human burial grounds. However, because the *Bike Path* component of the proposed HDC project would traverse previously undisturbed open land, there is a potential that human remains could be discovered during construction. Steps listed in the CEQA Guidelines Section 15064.5(e) will be followed if human remains are discovered during earth-moving construction activities. This includes requiring the contractor to stop work and contact the proper authorities (i.e., the Los Angeles or San Bernardino County Coroners) should any previously unknown human remains be discovered. No further study of this issue is required.

VI. GEOLOGY AND SOILS: Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

a (i). **Less Than Significant Impact.** The project study area is in a seismically-active area potentially influenced by several known active faults. However, the proposed project corridor does not traverse an Alquist-Priolo zone. The potential for future surface fault rupture along the alignment is considered low.

a (ii, iii). **Less than Significant With Mitigation.** The San Andreas Fault and the Cemetery Fault (a major fault trace of the San Andreas system) cross in a northwest to southeast direction at the base of the mountains in the vicinity of Pearblossom Highway (DOC, 1979). Potential seismic effects on the proposed *Bike Path* component of the HDC project include ground shaking, liquefaction, and seismic settlement. Intense ground shaking during an earthquake is considered the primary risk of potential future structural damage to *Bike Path*. The potential impacts associated with ground shaking would vary greatly, depending on the fault on which the earthquake occurs, the distance of the earthquake epicenter, and the magnitude and the duration of the earthquake episode. For the proposed project, the risk to cyclists and other path users is considered low, given that there would be very few structures involved.

Liquefaction occurs when loose soils lose their shear strength and behave as a liquid when subjected to strong, sustained ground shaking during an earthquake. According to maps developed by the California Department of Conservation (DOC, 2003), the proposed *Bike Path* component of the HDC project would cross several miles of land that may be susceptible to liquefaction. These areas, within the influence of Big Rock Creek and Little Rock Creek, are considered to have geological, geotechnical and/or groundwater conditions that indicate a potential for permanent ground displacements such that mitigation as defined in Public

Resources Code Section 2693(c) would be required. This potential impact would need to be further studied by a professional geologist. The project would incorporate all geotechnical study recommendations into the design, as applicable, and it would be constructed with professional oversight to meet all applicable federal, state, and city seismic design criteria. Given these considerations, no significant adverse effects associated with strong ground motion, including seismic-related ground failure or liquefaction, are anticipated.

a (iv). **No Impact.** The proposed project corridor is relatively flat. There are no slopes within the project corridor that rise at an angle of 10 percent or greater. Furthermore, the Department of Conservation's seismic zone hazard maps and County of San Bernardino's Geologic Hazards map (County of San Bernardino, 2009) do not identify the proposed project area as having the potential for landslide activity.

b. **Less than Significant With Mitigation.** The proposed *Bike Path* project would involve clearing and grubbing and grading. Therefore, without appropriate controls, construction activities could result in water quality impacts due to erosion and downstream siltation in the affected Mojave River and Antelope Valley watersheds. Erosion and siltation potential in the affected drainages would be increased during and after construction. However, in accordance with the statewide General Permit for Storm Water Discharges Associated with Construction, the proposed project would incorporate all applicable construction site best management practices (BMPs) to minimize potential loss of topsoil and/or soil erosion. In accordance with Caltrans' Stormwater Management Plan, an assessment of onsite stormwater flows must be conducted and treatment BMPs included in the project design to control the discharge of pollutants to storm drainage systems and receiving waters. Assuming compliance with Caltrans and local requirements for both temporary and permanent storm water controls, it is concluded that the proposed project would not result in substantial erosion or associated loss of top soil.

c. **Less than Significant With Mitigation.** See response to VI.a (iii, iv). Seismic settlement occurs when strong ground shaking allows sediment particles to become more tightly spaced, thereby reducing existing pore space. While the potential for subsidence within the proposed *Bike Path* corridor has not been determined, desert basin areas containing unconsolidated, relatively fine-grained sediments are generally considered to be potentially susceptible to subsidence. Caltrans' standard final design and construction techniques include measures to address soil stabilization and minimize the potential for settlement to a less than significant level.

d. **Less than Significant Impact.** Soils containing high clay content often exhibit a relatively high potential to expand when saturated and contract when dried out. This shrink/swell movement can adversely affect building foundations, often causing them to crack or shift, with resulting damage to the buildings they support. Within San Bernardino County the major soils affected would be Bryman loamy fine sand, Cajon sand, Cajon-Arizo Complex, Helendale-Bryman loamy sand, Helendale-Bryman loamy fine sand, Manet Coarse sand, and Mirage-Joshua Complex. Los Angeles County soils within the project alignment are Cajon loamy fine sand, Hesperia loamy fine sand, Hesperia fine sand, and Cajon loamy sand. Based on these criteria, soils were further classified into four hydrological soil groups: A, B, C, and D, where Type A is the most pervious with low runoff potential (such as sand and gravel), and Type D is the least pervious with high runoff potential (such as clay soils). In the project area, most of these soils can be characterized as type A or B (Parsons, 2013). According to the Soil Survey for the Mojave River area of San Bernardino County (USDA, 1986), the above-mentioned soils along the proposed project corridor predominantly exhibit a 'Low' shrink-swell potential.

e. **Less than Significant Impact.** Septic tanks or alternative wastewater disposal systems may be required at comfort stations along the proposed *Bike Path* alignment. According to the Soil Survey for the Mojave River area of San Bernardino County (USDA, 1986) soils along the stretch of the proposed project corridor generally exhibit severely limited qualities for septic tank absorption. In Los Angeles County, the Cajon and Hesperia soil series both exhibit moderate to rapid permeability (see https://soilseries.sc.egov.usda.gov/OSD_Docs). While adverse impacts associated with use of a few septic systems along the proposed 40-plus mile *Bike Path* are not expected to occur, site selection for any system installed should be carefully researched given the potential for soil limitations in some areas.

VII. GREENHOUSE GAS EMISSIONS: Would the project:

- a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
- b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

An assessment of the greenhouse gas emissions and climate change will be included in the body of the CEQA document. While Caltrans has included this good faith effort to provide the public and decision makers as much information as possible about the project, it is Caltrans' determination that in the absence of further regulatory or scientific information related to greenhouse gas emissions and CEQA significance, it is too speculative to make a significance determination regarding the project's direct and indirect impact with respect to climate change. Caltrans does remain firmly committed to implementing measures to help reduce the potential effects of the project. These measures are outlined in the body of the environmental document.

VIII. HAZARDS AND HAZARDOUS MATERIALS: Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25-mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a. **No Impact.** Small amounts of chemicals would be used at the site during construction, but these would be transported in accordance with existing laws and regulations. Due to the nature of the proposed project (i.e., *Bike Path*), its operation would not result in the transport, use, or disposal of hazardous materials; therefore, the proposed project would not create any significant hazards in this regard.

b. **Less Than Significant Impact.** There is a potential that previously unknown hazardous materials or underground storage tanks (USTs) could be uncovered during construction. Implementation of the Caltrans' standard construction procedures would substantially reduce the potential impacts on construction workers and the public due to discovery or disturbance of hazardous materials and USTs during construction. The proposed project would require the acquisition of some land that may have been contaminated based on existing and/or past uses, and that could be disturbed during construction. Required remediation of existing hazardous materials contamination would be addressed during the property acquisition phase and would be conducted consistent with all existing federal, state, and local regulations.

c. **No Impact.** Littlerock High School and Parris High School are the only schools located within 0.25-mile of the proposed project corridor. Contract documents will specify that the handling and application of hazardous materials (e.g., fuels, lubricants, solvents) used during construction be conducted in accordance with existing laws and regulations. *Bike Path* construction activity would be temporary and involve only a small number of vehicles and equipment at any one time; hence, adverse impacts associated with mobile-source air toxics are not expected. With the exception of police patrols, emergency response and path maintenance, operation of the proposed project would be limited to non-motorized, zero-emission activities.

d. **Less Than Significant Impact with Mitigation.** A records search will be conducted to determine whether the proposed project corridor traverses any sites contaminated with hazardous waste, including land that is listed under Government Code Section 65962.5 (Cortese list). Groundwater underlying contaminated property may be polluted; however, groundwater depths exceed 50 ft below ground surface, and are much deeper across most of the project area. Should encroachment into contaminated sites occur, appropriate procedures would be followed to provide adequate protection to workers and the general public.

e. **No Impact.** The east end of the proposed project corridor would be located approximately 1.4 mile (as the crow flies) from the end of runway at Southern California Logistics Airport. The *Bike Path* component of the proposed project would be located within Compatibility Review Area 3 but outside the runway approach surfaces for this airport. From a safety perspective the *Bike Path* would be considered an acceptable use within any airport hazard zones (Caltrans, 2011). Hence, the proposed project would not

result in a safety hazard for people residing or working in the project area.

f. **No Impact.** The proposed project corridor traverses in the vicinity of two small, private airports: Krey Field off of Sheep Creek Road in El Mirage; and Gray Butte Field at the terminus of E. Avenue R-8 on the County line. Krey Field is used primarily for gliders and other small aircraft. Gray Butte Field is primarily used to operate unmanned aircraft. The *Bike Path* component of the proposed project would be outside the main runway approach surfaces for these airports but may encroach upon transitional surfaces. Nevertheless, from a safety perspective the *Bike Path* would be considered an acceptable use within any airport hazard zones (Caltrans, 2011). Hence, the proposed project would not result in a safety hazard for people residing or working in the project area.

g. **No Impact.** Because of its rural location, neither construction nor operation of the proposed *Bike Path* project would interfere with current emergency response plans or emergency evacuation plans of local, state, or federal agencies.

h. **No Impact.** The termini of the proposed *Bike Path* would be located at the wildland/urban interface where the potential for fire damage is heightened. However, considering that the proposed project would neither involve construction of habitable structures nor revised land use designations to allow residential or commercial uses, it is concluded that there would not be an increased exposure of people or structures to a significant risk involving wildland fires. Caltrans' ongoing programs for brush clearance and weed abatement would continue through construction and operation of the proposed project.

IX. HYDROLOGY AND WATER QUALITY: Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
j) Inundation by seiche, tsunami, or mudflow	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a. **Less than Significant With Mitigation.** Design, construction, and operation of the *Bike Path* component of the proposed HDC project would be managed in accordance with applicable federal, state, and local water quality standards. Caltrans' Storm Water Management Plan, Storm Water Quality Handbooks, and District Directive 20 address stormwater management and would apply, as appropriate, to construction and operation of the proposed project. The proposed *Bike Path* would also be subject to the

requirements of Caltrans' existing National Pollutant Discharge Elimination System (NPDES) permit (Order No. 2012-0011-DWQ, NPDES No. CAS000003), which prescribes the use of BMPs to minimize erosion to the maximum extent practicable; therefore, the proposed project would not result in inconsistencies with or violations of federal, state, and local water quality standards.

b. **No Impact.** The proposed project site overlies the Antelope Valley and Victor Valley Groundwater Basins. According to the Preliminary Hydrology and Hydraulics Report (Parsons, 2013) for this project, groundwater in the project area is relatively deep. The paved surface of the new facility would not affect recharge of the underlying basins, as most recharge is attributed to perennial runoff at the foot of the mountains that percolates through the head of alluvial fan systems (DWR, 2004). In addition, the proposed *Bike Path* would not involve deep excavations.

c. **Less Than Significant with Mitigation.** Bridges are proposed over the deeper channels such as Turner Wash, Big Rock Wash and Little Rock Wash. Cross culverts are proposed at the other waterways that pass the project alignment, including Mescal Creek and Fremont Wash. The crossings would be designed to minimize impacts to the upstream and downstream water surface, flow velocities, and overall stream bed and embankment configurations. According to the Preliminary Hydrology and Hydraulics Report (Parsons, 2013), the proposed project would result in only minor changes to the existing drainage pattern within the planned freeway corridor. In addition, BMP controls would be applied so the proposed project would not result in substantial erosion or downstream siltation. The Caltrans Highway Design Manual requires the design of modified highways to direct stormwater and landscaping runoff to storm drains and to avoid unnecessary flow of water over unpaved and non-landscaped areas; therefore, the proposed project would not result in substantial impacts related to erosion.

d. **Less Than Significant Impact.** See response to Item IX.c. Flood hazard areas are identified in the aforementioned Preliminary Hydrology and Hydraulics Report. According to Flood Insurance Rate Map (FIRM) Panels 06037C0700F, 06037C0659F and 06037C0657F, Zone AO (an area inundated by shallow 100-year flooding, usually in the form of sheet flow) and Zone X (areas of moderate flood hazard, usually the area between the limits of the 100-year and 500-year floods) exists near the western terminus of the proposed highway in Palmdale. FIRM Panels 06037C0750F and 06037C0751F show the project alignment extending across areas within flood influence of Little Rock Wash and Big Rock Wash, both designated Zone A (an area inundated by 100-year flooding, for which no base flood elevations have been established). FIRM Panels 06037C775H and 06071C5750H show the alignment east of the Los Angeles County/San Bernardino County line to Richardson Road is within Zone D (an area of undetermined but possible flood hazards). According to FIRM Panels 06071C5780H and 06071C5785H, the alignment from Richardson Road to Adelanto Airport Road is within Zone X. The drainage pattern and flow rates within the project vicinity would remain unchanged with application of controls proposed in the Preliminary Hydrology and Hydraulics Report; therefore, no additional flow or flooding potential should be generated from construction of the HDC. In this way, the flow pattern, flow rates, overall water quality, and floodplains would not be significantly impacted within the watershed due to construction and operation of the proposed improvements. (Parsons, 2013)

e. **Less Than Significant With Mitigation.** See response to Items IX.c and IX.d. Caltrans' Design Manual requires that 100 percent of potential runoff from new impervious surface areas associated with the proposed project be treated before offsite discharge. In addition, new drainage facilities would be built to provide treatment of runoff from the freeway and adjacent *Bike Path* facilities. Drainage facilities would be designed to be consistent with established drainage plans for the area.

f. **Less Than Significant With Mitigation.** Within the *Bike Path* component of the proposed HDC project limits, there are no water bodies listed on the year 2010 303(d) list (SWRCB, 2010). Considering traffic volume is expected to grow substantially in the future, the amount of motor vehicle-related pollutants discharged into the watershed and drainage channels from impervious surfaces would increase either with or without implementation of the proposed HDC project. However, unlike the highway, operation of the proposed *Bike Path* would not result in a need to implement BMP controls for typical motor vehicle pollutants such as petrochemicals and metals.

As described above, BMPs would be designed and implemented to reduce the discharge of pollutants from the storm drain system to the maximum extent practicable. Typical measures would include the application of soil stabilizers such as rock slope protection, velocity dissipation devices and flared end sections for culverts. The final identification of BMPs selected for the proposed project would be determined at the PS&E stage. Given these considerations, the proposed project would not have a significant impact on local surface water resources and quality.

According to the Stormwater Data Report (Parsons 2010) prepared for this project, the groundwater table depth in the project area ranges from over 50 ft below ground surface (bgs) on the east end to over 400 ft bgs at Palmdale. In addition, the proposed *Bike Path* would not involve deep excavations. Given these considerations, the proposed project would not impact groundwater quality in this area.

g. **No Impact.** The proposed project would not involve construction of housing.

h. **Less Than Significant Impact.** See response to Items IX.c and IX.d. The design of the proposed project at drainage crossings and stormwater facilities would be coordinated with the Los Angeles County Department of Public Works and the County of San Bernardino Department of Public Works. At major wash crossings, the *Bike Path* would either be extended to cross on the proposed SR-138 highway bridges, or permanent detours would be established to divert cyclists onto existing nearby road crossings. Otherwise, the *Bike Path* by nature would not involve the construction of above-ground structures that could affect flood heights. At this stage of evaluation, it is undetermined whether construction of restrooms at comfort stations would be included as part of the project, but these facilities would be built outside of areas described above as being within flood-prone areas.

i. **Less Than Significant Impact.** See response to Items IX.c and IX.d and IX.h. Potential threats of dam inundation could affect the *Bike Path* component of the proposed HDC project area. In the unlikely event of dam failure at either Littlerock Reservoir or Palmdale Reservoir, the greater Palmdale region would be affected, including the proposed *Bike Path*. Dam failure at either Silverwood or Arrowhead lakes would cause flooding in the communities adjacent to the Mojave River to the east of the proposed

Bike Path. The proposed project could therefore potentially result in an increase in exposure of people or structures to a risk of loss, injury, or death involving flooding; this risk is considered low given there would have to be a catastrophic dam failure, there are no habitable structures associated with the Bike Path, and the path would be buffered by the new above-grade freeway (assuming the Bike Path is constructed along the north side of the new facility).

j. **No Impact.** The project site is not located on a lake or along a coastal area, so there is no potential for inundation by seiche or tsunami. Because the site is relatively flat desert land, there is also no potential threat associated with a mudflow.

X. LAND USE AND PLANNING: Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a. **No Impact.** The *Bike Path* component of the proposed HDC project is intended to connect communities in Victor Valley with those in Antelope Valley. The path would not physically divide any established communities within the High Desert.

b. **Less Than Significant Impact.** The proposed *Bike Path* would be consistent with federal, state and local policies in support of non-motorized travel. Support of bike trails is part of the County of San Bernardino's policy statement which reads, "Our vision for the future of the County includes a functional, safe and convenient transportation system, including public transit and trails for bicycles, pedestrians, and horses." The Circulation Element of the General Plan emphasizes the need for a comprehensive bicycle network. Goal CI 6 states, "The County will maintain and expand a system of trails for bicycles, pedestrians, and equestrians..." San Bernardino County also has a Non-Motorized Transportation Plan that focuses on bicycle and pedestrian use for recreational and commuting purposes. This 2001 plan is an attempt to comprehensively approach future planning and construction activities with regard to bicycle and pedestrian infrastructure. (County of San Bernardino, 2012) According to the Los Angeles County General Plan, Mobility Element, there is a "need for bikeways with a grade separation, lane delineation, or designated trail/path construction for bicycle users throughout the County." Goal M-2 calls for interconnected and safe bicycle- and pedestrian-friendly streets, sidewalks, paths and trails that promote active transportation and transit use. The Antelope Valley Areawide General Plan (Sanitation Districts of Los Angeles County, 2005), encourages "the development of an interconnected system of convenient bikeway routes and bikeway support facilities that interrelate to other transportation modes throughout the Antelope Valley." The County adopted a Bicycle Master Plan with the following purpose: "1) guide the development of infrastructure, policies and programs that improve the bicycling environment in the County; 2) depict the general location of planned bikeway routes throughout the County; and 3) provide for a system of bikeways."

c. **No Impact.** See Item IV.f.

XI. MINERAL RESOURCES: Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

a. **Less Than Significant Impact with Mitigation.** There are two identified Mineral Resource Zones (MRZs) in the Palmdale area, both classified as MRZ-2 (areas where adequate information indicates significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence). Sand and gravel are the primary resources that are mined in the area for the purpose of aggregate use in construction activities. The Little Rock Wash MRZ, which contains substantial aggregate deposits, would be traversed by the proposed *Bike Path* corridor. According to a map provided by the Sanitation Districts of Los Angeles County, the proposed *Bike Path* corridor would pass in the immediate vicinity of the Big Rock Wash MRZ; therefore, further analysis is necessary to determine if any impacts would occur to aggregate resources. In San Bernardino County the MRZs where substantial mineral resources have been determined or inferred to be present are located primarily along the Mojave River and near the western boundary of the Town of Apple Valley.

b. **Less Than Significant Impact with Mitigation.** Further analysis is necessary to determine if any impacts would occur to

mineral resources associated with either Little Rock Wash or Big Creek Wash. For the Big Rock Wash deposits, it is apparent that the MRZ does not extend north as far as East Palmdale Boulevard, and any encroachment would likely affect only the outer margin of the overall aggregate resource. During the Design Stage, alignment review in these areas should focus on resource avoidance.

XII. NOISE: Would the project result in:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a. **Less Than Significant with Mitigation.** Construction noise would be generated by diesel engine-driven construction equipment used for site preparation and grading, loading, unloading, and placing materials and paving. Diesel engine-driven trucks also would bring materials to the site and remove the spoils from excavation. Because of the mostly rural environment associated with the proposed *Bike Path*, the existing noise environment within the area can qualitatively be characterized as quiet. However, for this Initial Study assessment, it is assumed that the HDC freeway would be constructed prior to *Bike Path* operation; therefore the noise environment with the proposed freeway would be substantially louder than under current conditions. There are also very few residential or other occupied structures located along the project corridor. Addressed in this context, temporary *Bike Path* construction noise impacts should be less than significant. However, *Bike Path* alignment has not been determined, and based on further analysis noise-reduction controls could possibly be required in the vicinity of Littlerock High School and other receptors, if required in compliance with local government ordinances.

With the exception of vehicle access for police patrols and emergency response, the proposed *Bike Path* component of the HDC project would only accommodate non-motorized transportation modes. Hence, there would be no impacts associated with operation of the *Bike Path*.

b. **Less than Significant Impact.** Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used. The operation of construction equipment causes vibrations that spread through the ground and diminish in strength with traveled distance. Buildings in the vicinity of the construction site can be affected by these vibrations, with resulting damage in the most severe cases. Normal buildings that are not particularly fragile would not experience any cosmetic damage (e.g., plaster cracks) at distances beyond 25 feet based on typical construction equipment vibration levels. This distance can vary substantially depending on the soil composition between vibration source and receiver. Given the nature of the proposed project, and its rural location away from buildings, the *Bike Path* is not expected to generate groundborne vibration or noise levels that would result in damage to buildings or other structures. This conclusion will need to be confirmed in the Noise and Vibration Study to be prepared for the proposed project.

c. **Less Than Significant Impact.** For this Initial Study assessment, it is assumed that the HDC freeway would be constructed prior to *Bike Path* operation; therefore the noise environment with the proposed freeway would be substantially louder than under current conditions. See response to XII.a for discussion of operational noise associated with the *Bike Path*.

d. **Less Than Significant with Mitigation.** See response to XII.a for construction noise impacts associated with the *Bike Path*.

e and f. **No Impact.** See response to Item VIII.e and VIII.f. The proposed *Bike Path* project does not involve occupied structures, so it would not affect people residing or working within the vicinity of the nearby airports/airfields.

XIII. POPULATION AND HOUSING: Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

a. **Less Than Significant Impact.** For this Initial Study assessment, it is assumed that the HDC freeway would be constructed prior to *Bike Path* operation. Unlike a new highway or water/wastewater utility extensions, the *Bike Path* by itself is not expected to have any indirect effects on population and housing growth. The proposed *Bike Path* could possibly cumulatively contribute to indirect growth impacts that may occur near Palmdale or Adelanto as a result of new freeway development. However, any cumulative contribution would be considered small.

b. and c. **Less Than Significant Impact.** Land for a future *Bike Path* would be acquired as a part of overall ROW acquisition for the proposed future freeway. At 500-ft-wide, there would be enough available ROW to accommodate the freeway and other proposed transportation facilities. Total number of acquisitions required would depend upon alternative selected. However, because the corridor is sparsely populated, it is not anticipated that land acquired for *Bike Path* development purposes would trigger displacement of substantial numbers of existing housing or people. For full property acquisitions, property owners would be compensated the fair market value for properties subject to acquisition. As required by existing federal and state laws, Caltrans would comply with the provisions of the Uniform Relocation and Assistance Real Property Acquisition Policies Act of 1970, as amended (California Government Code, Chapter 16, Section 7260, *et. seq.*). Displaced persons would be entitled to reimbursement of certain actual, reasonable moving expenses pursuant to 25 California Code of Regulations (CCR) §6090, and compensation for replacement housing payments as provided by 25 CCR §§6102 and 6104. All benefits and services would be provided equitably to all affected parties without regard to race, color, religion, age, national origins, and disability as specified under Title VI of the Civil Rights Act of 1964.

XIV. PUBLIC SERVICES:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a (Fire and Police). **Less than Significant Impact.** As a *Bike Path*, the proposed project itself would not result in a need for new or physically altered governmental facilities that could cause significant environmental impacts. It would also not indirectly cause a need for increased fire or police services through population growth.

a (Schools). **No Impact.** The proposed project would not increase the demand, or create new demand, for school services.

a (Parks). **No Impact.** The proposed project would not increase the demand, or create new demand, for park services.

a (Other Public Facilities). **No Impact.** There are several public service facilities located within the project study area; however, the proposed project would not require the need for new or physically altered government facilities or the need to construct new facilities to maintain acceptable service ratios, response times, or other performance objectives for public services.

XV. RECREATION:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

a. **Less Than Significant Impact.** The east side of the proposed *Bike Path* would terminate in the immediate vicinity of Richardson Park. Located at Montezuma Street and Air Expressway Boulevard in the City of Adelanto, this multi-purpose park includes both active and passive recreation facilities. Littlerock High School at the west end of the *Bike Path* in the Sun Village community also has several active-use fields and other recreational facilities. The proposed project would not directly affect these existing recreational facilities. Furthermore, it would not indirectly result in increased use of existing park and recreation areas, such that their substantial physical deterioration would occur. As a new recreational facility, the *Bike Path* would comprise a beneficial impact. Therefore, proposed project impacts on publicly owned park or recreation areas would be insignificant.

b. **Potentially Significant Impact.** The proposed *Bike Path* component of the HDC project involves construction of a new recreational facility. As described in this Initial Study, there are some potentially-significant impacts associated with new *Bike Path* construction.

XVI. TRANSPORTATION/TRAFFIC: Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

a. **Less Than Significant Impact.** See response to Item X.b. Analysis of the proposed *Bike Path* between the cities of Adelanto and Palmdale is consistent with Caltrans policy for accommodation of non-motorized travel. Deputy Directive 64 (DD-64) requires that Caltrans “fully consider the needs of non-motorized travelers (including pedestrians, bicyclists and persons with disabilities) in all programming, planning, maintenance, construction, operations and project development activities and products.” The proposed project should be consistent with all local plans, ordinances, or policies establishing measures of effectiveness for the performance of the circulation system. In fact, the proposed project is designed to comply with both San Bernardino and Los Angeles county policies to establish interconnected and safe bicycle- and pedestrian-friendly streets, sidewalks, paths and trails that promote active transportation and transit use to improve level-of-service and to help relieve congestion on the freeway and adjacent roadways.

b. **No Impact.** Congestion Management Planning statute requires development of a travel demand management (TDM) element that promotes alternative transportation methods, *including bicycles*. Both the Los Angeles County Metropolitan Transportation Authority’s (Metro, 2010) and San Bernardino Associated Governments’ Congestion Management Plans contain Travel Demand Management chapters that address bicycle access and parking, and encourage transit, pedestrian and bicycle-oriented developments.

c. **No Impact.** Due to its nature as a bicycle facility, the proposed project would not affect air traffic patterns.

d. **Less Than Significant Impact.** The proposed *Bike Path* facility would be designed to provide for the safety and security of all users. The design would be in accordance with the Highway Design Manual, Chapter 1000, which includes requirements for minimum path dimensions, banked curves, clearances, and other measures intended to minimize public safety incidents.

e. **Less Than Significant Impact.** It is assumed that the new freeway facility would be operational prior to completion of the *Bike Path*. In this regard, should emergency services be needed during *Bike Path* construction, access to the incident would be available via the freeway. Police patrol routes and emergency service planning would need to be adjusted once the new freeway and *Bike Path* are operational. This issue will be further evaluated in the environmental document, including the adequacy of police and fire emergency response times in the area.

f. **Less Than Significant Impact.** The proposed project would facilitate improved transit, bicycle and pedestrian use within and between the Victor Valley and Antelope Valley communities. While further study is necessary, the proposed *Bike Path* component of the HDC project should not conflict with any adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities. As construction would occur across a largely undeveloped, rural High Desert area, there should be no short- or long-term transit service delays or effects on existing bicycle and pedestrian facilities.

XVII. UTILITIES AND SERVICE SYSTEMS: Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project’s projected demand in addition to the provider’s existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project’s solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

a. **No Impact.** In comparison to overall system capacity, very minimal wastewater would be generated by the proposed project during construction. Due to the nature of the proposed project, there would be no wastewater produced during facility operation that would be discharged to a publicly-owned treatment plant.

b. **No Impact.** The proposed project consists of constructing a bike path alongside a proposed freeway. New wastewater or water treatment facilities are not a component of the proposed project. Limited water used at the site, such as for dust control during construction, would be metered from local fire hydrants.

c. **Less Than Significant Impact.** The proposed *Bike Path* would require the construction of new storm water drainage facilities; however, the majority of these should already be in place assuming the freeway is constructed first. See responses to Items IX.c, IX.d, and IX.e regarding potential impacts.

d. **Less Than Significant Impact.** It is anticipated that drought-tolerant plants would be incorporated into landscape plans developed for the proposed project. While irrigation water would be required for landscaping, the volume of water needed for this purpose would be small and would not trigger the need for new water sources or affect expansion of an existing facility to meet the additional water needs.

e. **No Impact.** As a proposed transportation project, neither its construction nor operation would substantially increase the amount of wastewater generated at the site over current rates; therefore, the capacity of current providers to treat the wastewater volumes within the study area would be unaffected by the proposed project.

f. **Less Than Significant Impact.** The nearest operating landfills are the Victorville Landfill, located at 18600 Stoddard Wells Road in the City of Victorville and the Antelope Valley Recycling and Disposal Facility at 1200 W. City Ranch Road in Palmdale. The Lancaster Landfill and Recycling Center, located at 600 East Avenue F in the City of Lancaster, is also an option. The Victorville Landfill is capable of accommodating waste from the proposed project that needs to be disposed, has current capacity to operate until 2020, and room for further expansion of capacity (Staggs, 2012). The Antelope Valley landfill has an estimated remaining life of 140 years, and the Lancaster landfill has a remaining life of about 49 years (County of Los Angeles, 2012). While there would be trash receptacles at the new facility, the vast majority of solid waste disposal requirements would occur during construction of the proposed *Bike Path*, and mostly in the form of green waste. Accordingly, the proposed *Bike Path* project would have a less than significant impact on landfill capacities.

g. **Less Than Significant Impact.** The proposed project would be conducted in compliance with all federal, state, and local codes and regulations pertaining to the disposal of solid waste. These codes include Part 13 Title 42 – Public Health and Welfare of the California Health and Safety Code, and Chapter 39 Solid Waste Disposal – of the United States Code. The proposed project would also be compliant with AB 939, the California Solid Waste Management Act, which requires each city in the state to divert at least 50 percent of their solid waste from landfill disposal through source reduction, recycling, and composting. Given these considerations, there would be no significant impacts associated with consistency related to laws pertaining to solid waste disposal.

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

a. **Potentially Significant Impact.** The area within the project ROW could potentially support unique, threatened, or endangered species of plants, animals, or their critical habitats. While several special status plant species have been recorded in the proposed project region, most have a low to moderate potential to occur at the site. Of these species, some have been recorded at Edwards Air Force Base, where they are associated with the margins of dry lake beds with different conditions from those in the project area. Joshua tree and yucca species, locally sensitive species protected under local ordinances and the California Desert Native Plants Act, are found within Mojave creosote bush scrub, Mojave mixed woody scrub, Joshua tree woodland, and partially stabilized desert sand field communities. Numerous special-status wildlife species potentially occur in or around the project area including Mojave ground squirrel; desert tortoise; loggerhead shrike; red-tailed hawk, burrowing owl, Swainson's hawk; mountain plover; silvery

legless lizard Mojave fringe-toed lizard; and special status bats. Given these considerations, potentially significant impacts due to *Bike Path* construction and operation may occur.

The High Desert region has a history of European exploration and westward settlement dating back to the 18th Century. The *Bike Path* corridor also traverses an area that has been assigned 'Moderately High' sensitivity according to the City of Palmdale General Plan. Given these considerations, there is the potential that the proposed *Bike Path* could result in adverse impacts to historic and/or archaeological resources.

b. Potentially Significant Impact. The proposed *Bike Path* is being considered as a component of a much larger High Desert Corridor project involving construction of a new freeway and possibly a new passenger railroad across 63 miles of desert between Apple Valley and Palmdale, California. As such, *Bike Path* construction would cumulatively contribute to impacts associated with a proposed six-lane freeway plus center-median rail, with an ultimate facility of four lanes plus an HOV lane in each direction. Potentially significant cumulative impacts would occur within the following issue areas: aesthetics; agricultural resources; biological resources; and cultural resources.

c. Less Than Significant Impact. The proposed project corridor, while not traversed by any Alquist-Priolo Zone, is in a seismically active area potentially influenced by several known active faults, including the San Andreas Fault which crosses in a northwest to southeast direction at the base of the mountains in the vicinity of Pearblossom Highway. Potential seismic effects on the proposed *Bike Path* component of the HDC project include ground shaking, liquefaction, and seismic settlement. Intense ground shaking during an earthquake is considered the primary risk of potential future structural damage to *Bike Path*. The potential impacts associated with ground shaking would vary greatly, depending on the fault on which the earthquake occurs, the distance of the earthquake epicenter, and the magnitude and the duration of the earthquake episode. The proposed *Bike Path* component of the HDC project would cross an approximately 3.3-mile-long stretch of land that may be susceptible to liquefaction. This potential impact would need to be further studied by a professional geologist. The project would incorporate all geotechnical study recommendations into the design, as applicable, and it would be constructed with professional oversight to meet all applicable federal, state, and city seismic design criteria.

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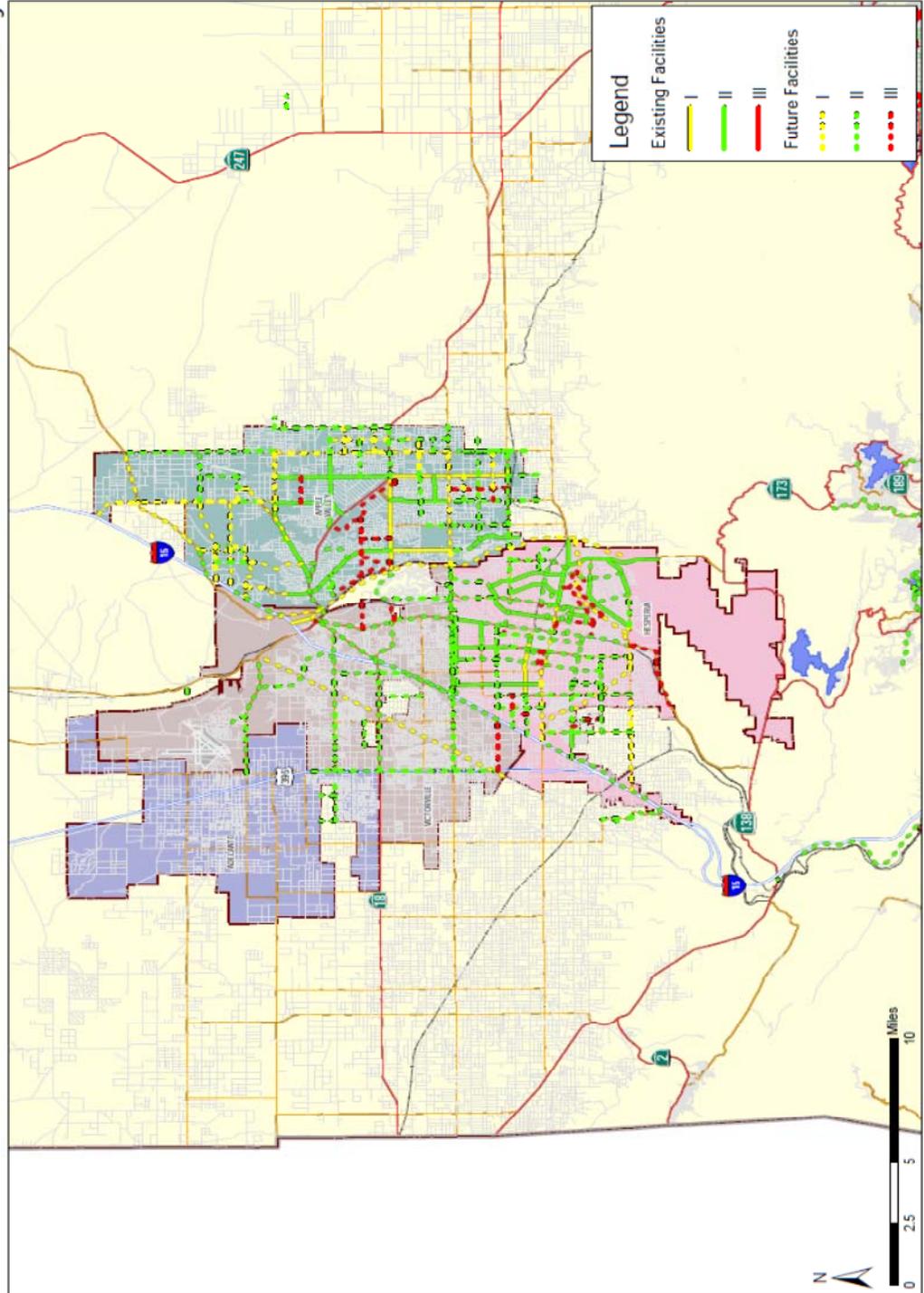
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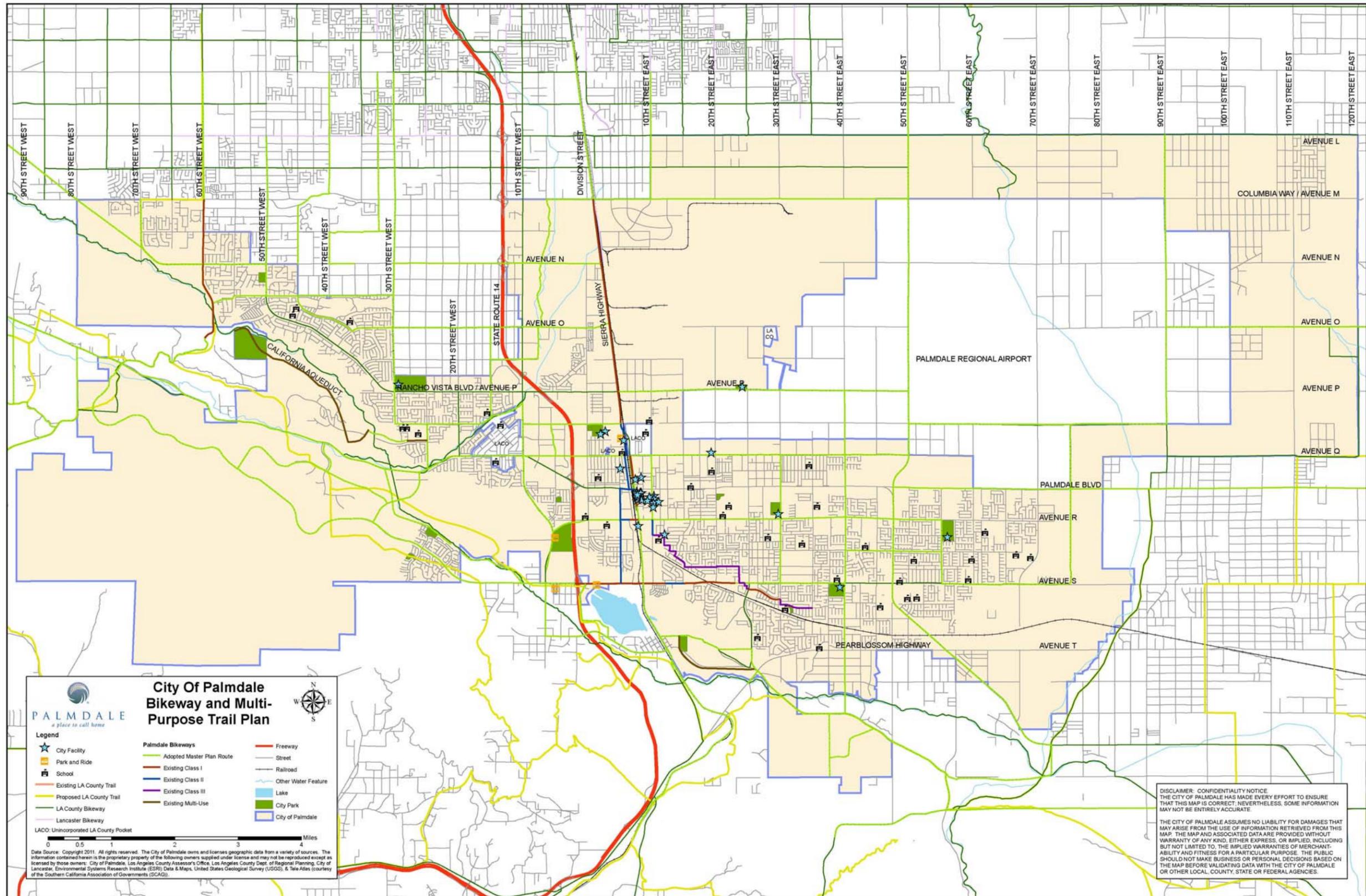
APPENDIX D

LOCAL GOVERNMENT PLANS FOR BICYCLE FACILITIES

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Figure ES.3 Bicycle Facilities
Victor Valley

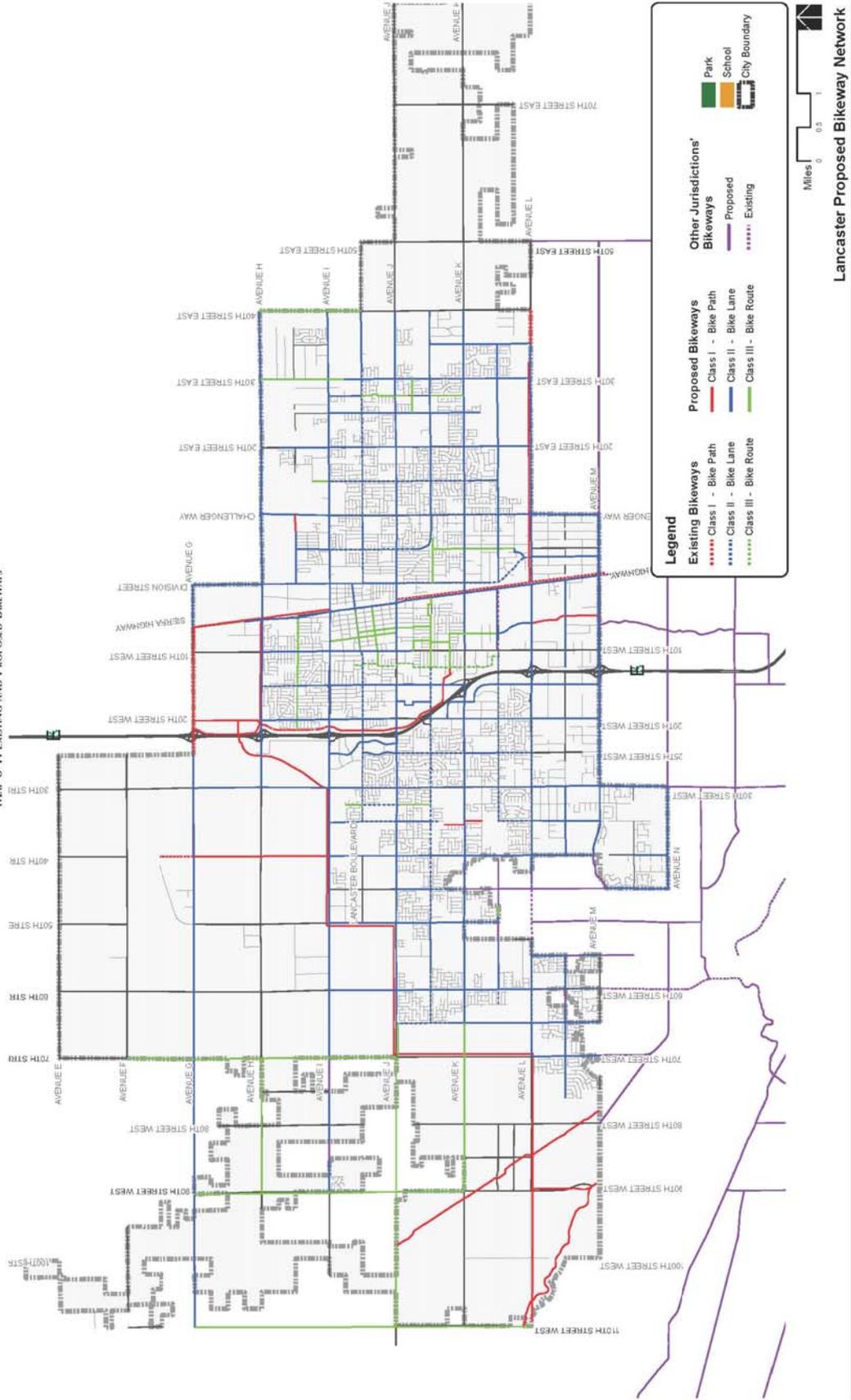




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MAP 6-1: EXISTING AND PROPOSED BIKEWAYS



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